CAPI
The Canadian Agri-Food Policy Institute

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L'Institut canadien des politiques agro-alimentaires

Finding Common Ground

Food for a Healthy Population and a Healthy Agri-food Sector

A Synthesis Report

Prepared for the
Canadian Agri-food Policy Institute

December 2007

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EXECUTIVE SUMMARY

Finding Common Ground: Food for a Healthy Population and a Healthy Agrifood Sector

Synthesis Report

Project purpose

Increasingly, developed and developing nations are recognizing the relationship between health and food. This recognition is emerging as human health issues, and in particular health-care costs, are becoming a monumental concern. In Canada, obesity, diabetes and cardiovascular diseases are approaching epidemic proportions. The social and economic costs of these diseases are staggering. The agriculture community, as a key source of food, has a huge role to play in the health of Canadians, and can help reduce burgeoning health-care costs. Indeed, both human health and the agriculture industry stand to benefit greatly from an integrated agrifood policy framework. An appropriate vision for Canadian agriculture might constitute the foundation of a healthy and sustainable Canadian society.

In the spring of 2007, a coalition of government, industry and non-profit organizations launched a major study to examine the relationships between population health and the agrifood sector. The study has been coordinated by the Canadian Agrifood Policy Institute (CAPI), a non-profit corporation that provides an independent voice on agrifood policy issues. The study's objective has been to identify initiatives that can provide Canadians with improved health benefits, while contributing to the economic wellbeing of the agricultural and food sector. The project team was charged with reviewing initiatives relating to food and health that have demonstrated an impact on the health of the population and the agrifood sector in Canada and other countries, or could potentially do so in the future. The initiatives could include strategies, policy instruments, programs and policies, products, and governance. Key to this work is identifying principles and lessons learned for an integrated agrifood and health policy.

Objectives and key principles for an integrated agrifood and health policy

An integrated agrifood and health policy seeks to improve the health of the country's population, while strengthening the economic wellbeing of the agriculture and food sectors. The goals of this policy should be strategic and achievable, while accounting for Canada's economic and social realities.

Components of an integrated agrifood and health policy should include:

- Strategic collaboration
- Regulatory and economic framework
- Population health strategy and education
- Monitoring and evaluation
- Research and innovation

Lessons Learned and Guiding Principles

The CAPI project team made several observations that could be categorized as "lessons learned" in the effort to develop an integrated agrifood and health policy for Canada. Some of these are described below. Unfortunately, no "magic bullet" exists that provides the single-source solution to improving Canadians' health benefits while contributing to the economic wellbeing of the agrifood sector.

- Components of an integrated agrifood and health policy should include: strategic collaboration, a regulatory and economic framework, a population health strategy that includes an education component, monitoring and evaluation, and research and innovation;
- Many of the initiatives reviewed for this project are quite recent and have not yet been fully evaluated for their impacts on food consumption patterns, health outcomes, or agriculture (particularly on farmers). Monitoring and data collection need to be included when a new policy is initiated to assess impacts. This built-in evaluation component is necessary in order to develop a useful, evidence-based approach;
- The vast majority of policy initiatives to date have been too fragmentary to guarantee success. The relevant linkages between food and health lie well beyond the purview of any one agency;
- Agriculture is essentially a market-driven activity, while health is a social good that rarely has to pass the economic viability test. Thus an integrated agrifood and health policy is a challenge. A transparent dialogue between the agriculture and health sectors is needed. In Canada, as in Europe, most integrated food and health strategies to date have operated in isolation from the agriculture sector. To prove successful, integrated policies must be developed through a process that includes producers in the food chain;
- In Canada, the development of both agricultural and health policies has been complicated by shared jurisdictions between the federal and provincial governments. Superimposing an integrated approach on this structure creates additional challenges. A fully integrated approach requires strategic collaboration across government jurisdictions, ideally including the participation of local, community-based institutions, non-government and industry groups, health professionals and agricultural producers;
- The integration of agrifood and health policies must be put into a historical perspective/context. Canada has a deep history of traditional export agriculture that responds mostly to market forces. Integrating agriculture with food and health concerns domestically is a relatively recent concept that will require considerable education and adaptation on the part of all parties: the agricultural community, health organizations, governments, industry, and citizens;
- The development and implementation of an integrated agrifood policy is further complicated by the globalization of the food supply, international trade agreements and regulations, and increased collaborations aimed at achieving noticeably improved population health;
- Linking agriculture to health requires a more educated consumer who takes greater responsibility for his/her choices. The marketing and distribution of processed foods is dominant and pervasive in advanced societies. Due to the complexity of the modern food supply and the relationship of diet to health, the need exists for government departments and non-governmental organizations to provide greater support to consumers who are trying to achieve an optimal diet. Citizens who desire a healthier lifestyle also need to

invest time in seeking out healthy foods and educating themselves on where those foods originate. Understandably, economic and social considerations may limit the ability of certain groups in society to access a safe and nutritious food supply;

- An integrated policy needs systems/multidisciplinary thinking. A systems-thinking approach requires collaboration among diverse stakeholders, linking health and agricultural priorities. It requires formulating policy options at multiple levels and through multiple channels. A multidisciplinary approach involves drawing expertise from multiple disciplines to define and apply new ways of understanding the inter-relationship of agriculture, food and health;
- Policy-makers must have realistic expectations. No magic bullet exists in the pursuit of an effective policy that integrates agrifood and health. Often, genuine results can take a decade or longer. Successful strategies usually require a combination of multiple components, such as multi-level and cross-sectoral strategic collaboration along with a regulatory and economic framework. Population health policies – particularly those that introduce healthy eating projects in schools and other community-level institutions – often work hand-in-hand with education and marketing initiatives, and are best implemented through the strategic collaboration of numerous agencies.

Recommendations and next steps

A number of recommendations flow out of this analysis:

1. The federal government, working with stakeholders, should develop a vision for an integrated agrifood and health policy in Canada. The federal departments involved should include Agriculture and Agri-Food Canada, Health Canada, Environment Canada, and the Department of Finance.

2. This initiative should have an appropriate "political champion," perhaps out of the Prime Minister's Office. This level of involvement appears to be required to integrate concepts of sustainability into a food and health policy.

3. The Canadian Agri-Food Policy Institute (CAPI) should facilitate the development of this vision, which should include the participation of provincial governments, industry groups, and health related organizations and professionals.

4. The governments and stakeholders involved in developing the vision should define the role of governments, industry and society (from an information, regulatory, and incentive-based perspective) in an integrated agrifood and health policy.

5. The participating governments and stakeholders should make monitoring and data collection central to any agrifood and health policy that emerges from the development of an integrated strategy. This built-in evaluation component is necessary in order to develop a useful, evidence-based approach, as opposed to piece-meal and "after the fact" analyses.

6. Initiatives that purport to have beneficial health impacts, whether they be technological in nature (e.g., functional foods or nutrigenomics), or social in nature (e.g., short food supply chains), should be validated and evidence-based.

7. The participating agencies should develop and appropriately fund a research strategy and structure to support an integrated agrifood and health policy.

8. The participating agencies should put more focus on the interface of food and health for women, infants and children.

In the course of this review – and as a result of comments from referees – many other relevant issues emerged. But scope and time constraints kept the project team from exploring them in detail. The project team recommends that future work be undertaken on the following topics:

- Initiatives relating to the integration of agrifood and health policies and programs at the provincial level;
- The effect of agriculturally related environmental issues on health (e.g., water quality and disease transmission from animals to humans);
- The changing structure of the agrifood industry, including increased concentrations due to globalization, and the impact of these changes on health. Observers have noted that business decisions by multinational companies are not necessarily compatible with national government goals and objectives;
- Obesity as a behavioral issue, not just a health issue. Observers have argued that personal change is an essential first step to making health and nutrition initiatives successful;
- Methodology for measuring the benefits of improved nutrition;
- The applicability to Canada of an independent statutory agency similar to Food Standards Australia New Zealand (FSANZ);
- The concept of the "Canadian Climate Change Advantage Diet."

Acknowledgements

This report has benefited from many peoples' efforts.

We acknowledge the foresight and vision of the Canadian Agri-food Policy Institute (CAPI) in initiating this project on the interface between food and health. The objective was to find some "win win" opportunities that would benefit the health and wellbeing of Canadians while contributing to the economic wellbeing of the agricultural and food sector. The financial support of the following organizations is also acknowledged: Agriculture and Agri-Food Canada, Health Canada, the Canadian Food Inspection Agency, the Public Health Agency of Canada, the Canadian Institutes of Health Research, the Canadian Council of Grocery Distributors, Dietitians of Canada and the Heart and Stroke Foundation of Canada.

We have benefited from the professional work and views of the investigators throughout this project. Drs Allan Best, Lise Dubois, Michael Heasman, Spencer Henson, Bernie Sonntag and Rickey Yada brought not only a wealth of technical knowledge and professional experience to the table, but also a willingness to work under very tight timelines. They offered many helpful suggestions and insights, and were gracious when the authors of this report didn't always incorporate these gems into the synthesis report. In addition, Drs Andreas Boecker and John Cranfield were involved in the preparation of some background reports.

This report benefited immensely from the ability of our editor, David Wylynko of West Hawk Associates, to synthesize the information. He helped "make a silk purse out of a sow's ear"!

Insightful and critical comments on an earlier draft of this report were received from a number of independent reviewers. These included: Drs Hartley Furtan, Michael McBurney, Arnold Naimark, John Oliver, Grant Pierce, and Gustaaf Sevenhuysen.

In preparing this report, we made use of material prepared for the Technical Report, (a separate document) as well as other written materials and ideas from conversations with a wide range of people. In the end, we put our own interpretation on what we read and were told. Accordingly, the views expressed in this report are our own and we accept responsibility for any errors of interpretation or omission. CAPI does not necessarily endorse the views and recommendations contained in this report.

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Synthesis Report

1 Introduction

1.1 Project purpose and general approach

In Canada and abroad, governments, industry and health organizations are increasingly recognizing the relationship between health and the agrifood sector. This recognition is emerging as human health issues, and in particular health-care costs, are becoming a huge concern. In Canada, obesity, diabetes and cardiovascular diseases are approaching epidemic proportions. The social and economic costs of these diseases are staggering. Agriculture and food production have a huge role to play in population health. In Canada, policymakers are realizing that human health, and the agriculture industry, could both benefit significantly from an integrated agrifood policy framework.

In the spring of 2007, a coalition of government, industry and not-for-profit organizations launched a major study to examine the relationships between population health and the agrifood sector. The study has been coordinated by the Canadian Agrifood Policy Institute (CAPI), a non-profit corporation that provides an independent voice on agrifood policy issues. The CAPI vision is "Agriculture and Agrifood…Providing Solutions that Contribute to the Quality of Life of Canadians"[1]. In addition to CAPI, the federal government, industry, and public health groups supported this project: Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency, Health Canada, the Public Health Agency of Canada, the Canadian Institutes of Health Research, the Canadian Council of Grocery Distributors, Dietitians of Canada and the Heart and Stroke Foundation of Canada.

The project's aim was to identify initiatives that could provide Canadians with improved health benefits while contributing to the economic wellbeing of the agricultural and food sector. The project team reviewed food and health initiatives, in Canada and abroad, that have impacted (or likely will impact) the health of the population and the agrifood sector. The team examined strategies, programs and policies, products, and governance. A key objective was to identify principles and "lessons learned" which could contribute to the development of a homegrown, integrated agrifood and health policy for Canada.

The project team, appointed by the CAPI Board, consisted of the project manager (Dr. Ed Tyrchniewicz), the senior health advisor (Dr. Bruce McDonald), and six experienced investigators knowledgeable in various aspects of the agrifood value chain and the health sector (Drs. Allan Best, Lise Dubois, Michael Heasman, Spencer Henson, Bernie Sonntag and Rickey Yada). (See Appendix A for brief biographies).

[1] CAPI February 2007

The synthesis report which follows includes: a brief overview of the issues (health and nutrition, farm income, food safety and regulatory framework); conceptual framework for an integrated agrifood and health policy in Canada; evolution of agricultural policies, nutrition and health policies and dietary fat policies in Canada; review of selected approaches and initiatives for an integrated food and health policy; broader issues impacting an integrated food and health policy for Canada; lessons learned and guiding principles for an integrated food and health policy for Canada; some promising approaches, and recommendations. A separate Technical Report presents some of the background work that underpins this synthesis report.

1.2 Health and nutrition issues in Canada

In recent years, several provincial governments have expressed concern with the exponential increase in health care expenditure. Over the next 10 years, health care costs could seriously erode all other expenditures if nothing is done to curb this trend. In Canada, health expenditures over the past 30 years, and especially over the past decade, have increased much more rapidly than the gross domestic product (GDP). Figure 1 illustrates two significant trends that have occurred at the national level[2]. Between 1975 and 2005, the total expenditure on health care as a percent of GDP (in real terms) has increased from 7% to 10.5 percent. Meanwhile, Canadian health expenditures per capita more than doubled, from about $1,700 to about $3,600 during this same period (in real terms: 1997 $s).

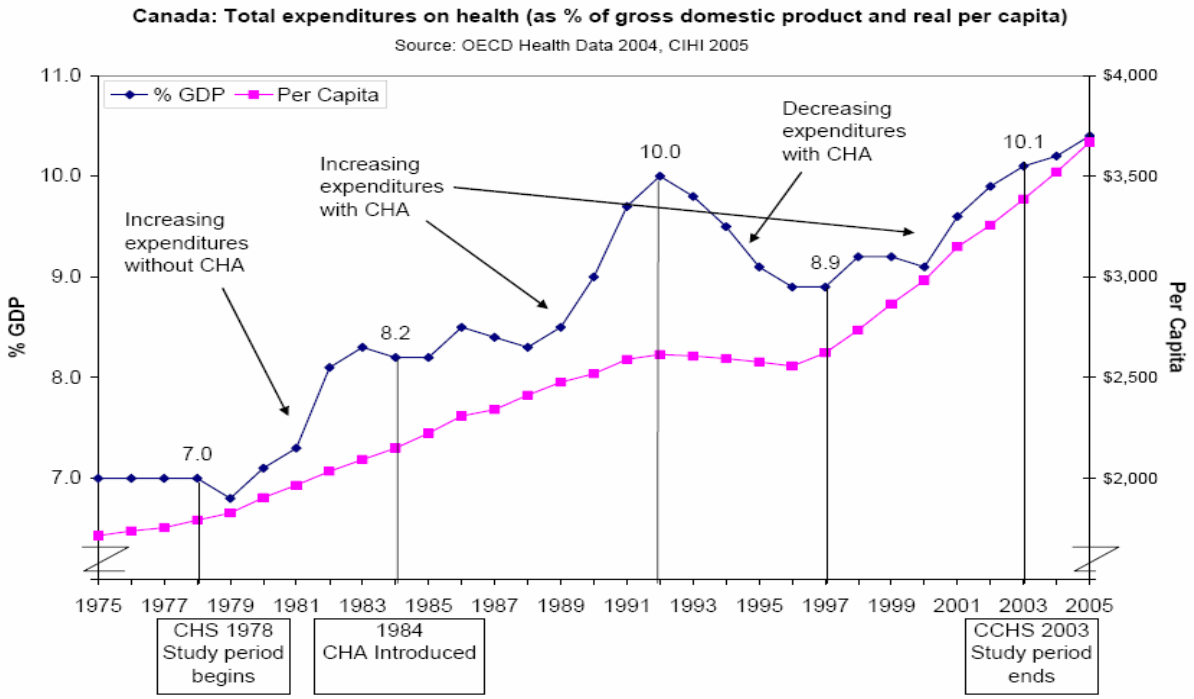
The cost of chronic diseases (such as cardiovascular diseases (CVD) and Type 2 diabetes) is huge and rising in Canada. Obesity and poor lifestyle choices (e.g., diet, lack of physical activity, and use of alcohol) are also increasingly prevalent. Research has shown that CVD has been shown to have a significant relationship with diet. In 1998, this disease alone was estimated to have cost the Canadian economy $18 billion[3]. Not only is CVD the leading cause of mortality among both men and women, it also is the leading cause of hospitalization (18% and 13%, respectively)[4]. Since 1971, there has been a slight decrease in the rate of hospitalization (no. per 100,000 population). Yet actual numbers have increased linearly, and experts predict them to continue to increase over the next decade due to the increasing number of elderly in the population. CVD also accounts for a large number of the total visits to physicians (9%; 26.4 million in 1998) and the percentage of prescriptions (13%; 32.5 million in 1998).

The notable increase in obesity and Type 2 diabetes among Canadians of all ages is of serious concern. In 2001, the proportion of national health expenditures attributable to obesity in Canada was 2.4 percent. Indeed, three of the most expensive diseases (CVD, hypertension and osteoarthritis) are associated with obesity. As well, significant indirect costs have been linked to chronic diseases. In 2005, the loss of income attributable to CVD and diabetes was estimated at $600 million ($500 million US). This number is expected to reach $1.5 billion by 2015. In 2000, the estimated annual cost of poor lifestyle choices (primarily diet and lack of physical activity) was $6.3 billion, including $1.8 billion in direct health costs[5].

[2] Curtis and McMinn 2007
[3] Heart and Stroke Foundation of Canada
[4] Heart and Stroke Foundation of Canada 2000
[5] McAmmond et. al 2000

Diet is a major factor in many of the chronic diseases Canadians experience today. Therefore, it is understandable why nutrition and the food supply have become key factors in discussions related to population health. Improved nutrition has the very real potential to reduce these costs. The 2007 Canadian Population Health Report, for example, estimated that only 41% of Canadians aged 12-64 years complied with the key recommendation of Canada's Food Guide, namely that they consume five or more servings of fruits and vegetables daily.

Figure 1



Source: Curtis and McMinn 2007

1.3 Food safety concerns[6]

In the past two decades, foodborne diseases have emerged as an important and growing public health and economic problem. Contamination of foodstuffs by microorganisms (e.g., bacteria, fungi, parasites, and viruses), chemicals (e.g., food additives, pesticides, and veterinary drugs), toxins and allergens can occur at any stage of the process from food production to preparation. In addition, food contamination may occur through environmental pollution (air, water, soil).

Foodborne diseases, which are usually acute in nature (self-limiting and short duration), are an increasing concern for governments and industry, especially in terms of economic impact and social disruption. Several factors contribute to this situation, such as:

[6] For more details and complete references see Dubois 2007

- globalization of the world's food supply and the ease of worldwide shipments of fresh and frozen food;
- the finding that traditional agents are increasingly associated with foods that were not of previous concern (e.g., *Salmonella* on ready-to-eat salads packaged and distributed internationally);
- migrant populations demanding their traditional foods in their country of settlement;
- identification of new agents that cause life-threatening conditions;
- increasing number of outbreaks of foodborne diseases being reported;
- the impact of foodborne disease on young children, the aging population and immunocompromised people.

Deaths from acute foodborne illnesses, while relatively rare, are more likely to occur in the very young, the elderly and individuals with compromised immune systems (e.g., those with cancer or AIDS). Nonetheless, the US Food and Drug Administration estimates that 2-3% of all acute foodborne disease cases develop secondary long-term illnesses. Society is now more aware of such diseases thanks to new molecular technologies that allow us to track and confirm the sources and distribution of foodborne-diseases.

In the near future, foodborne illnesses are only expected to become a greater problem. This occurrence is anticipated, in particular, because existing pathogens are increasingly resistant to drugs, because new pathogens are emerging, and due to the continuing globalization of the food supply. In 2000, the five bacterial foodborne pathogens (viz., *E. coli* 0157 and other STEC – Shiga toxin producing *E. coli*, the main cause of hemolytic uremic syndrome – *Campylobacter*, *Listeria* and *Salmonella*) were estimated to cost the U.S. economy $6.9 billion. However, these cost estimates are modest. They fail to include the travel cost to obtain medical care, time lost from work caring for sick children, or the cost of chronic complications (such as the reactive arthritis associated with *Salmonella*).

Moreover, these estimates did not include costs to the food industry or public health costs. For example, even though the Bovine Spongiform Encephalopathy (BSE) crisis in Canada in 2003 had no direct consequences on the health of individuals, it had a major effect on the Canadian food and agriculture industry. The handling of this crisis by the Canadian Food Inspection Agency (CFIA), other government agencies, and the Canadian cattle industry limited economic losses. Yet the U.S. border still is not open to live cattle over 30 months of age.

At the peak of the crisis in 2003 and 2004, the BSE was estimated to have cost the Canadian cattle industry $11 million per day. Today, it is still estimated to cost the industry $1.5 million per day. Another situation like the BSE crisis, were it to occur, could have a much more devastating effect on the food and agriculture industry. The price of food could also be affected by such a situation, making access to some types of food (e.g., meat, fresh produce) difficult for some groups in the population.

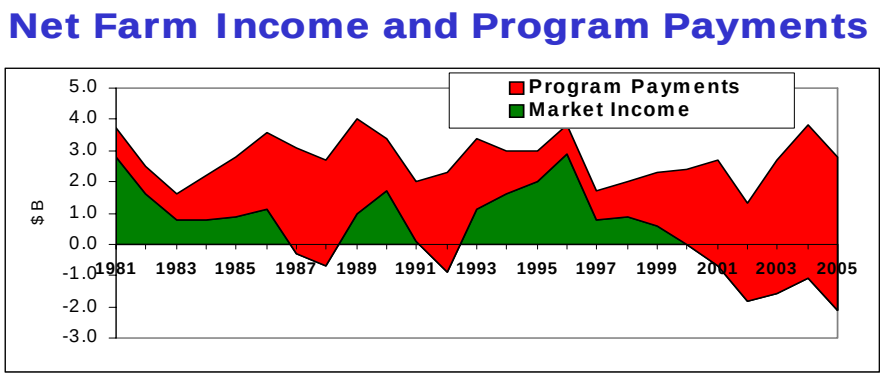
The recent development of novel foods, such as genetically modified foods, adds to these concerns. Internationally, new regulations on food authenticity, traceability and nutritional labeling are under consideration. In Europe, new regulations are already being developed, thanks to a history of weak control over problems associated with food, animal feed, and animal

diseases. Europe is also experiencing a crusade to restrict the production and use of foods and feed ingredients derived through biotechnology. People are also demanding that these foods and food ingredients be labeled. Similar concerns have been voiced in Canada and elsewhere.

1.4 Farm income issues[7]

In Canada, adequate and stable levels of farm income continue to over-shadow all other aspects of agricultural policies. Figure 2 illustrates graphically that program payments play a significant role in offsetting negative aggregate farm income, especially since 2001. Clearly, globalization is creating strains on conventional Canadian agriculture. Finding the solution to Canadian farm income problems will demand that governments and industry think beyond a commodity-based approach. It is risky to generalize that Canadian agriculture is in the mature or declining stage of its life cycle. Yet it would appear that some parts of agriculture, particularly traditional export commodities, clearly are in such a stage. New products and approaches are needed.

Figure 2



Source: Canadian Agri-Food Policy Institute

Agriculture in Canada has a wealth of potential. It can help reduce the burgeoning health deficit, improve quality of life, and embrace environmental sustainability. In this process, agriculture has the potential to enhance farm incomes and improve the image of agriculture. Indeed, an apt vision for Canadian agriculture might be thought to constitute the foundation of a healthy and sustainable Canadian society.

Farm income can be derived from four key areas: primary unprocessed farm commodities, "value added" processed food and other agricultural product production, products of the knowledge based bio-economy, and ecological goods and services. Farm incomes can certainly be improved through products of the knowledge-based bioeconomy, including health food

[7] For more details see Tyrchniewicz and Tyrchniewicz 2005

products. However, the markets for these products are small, and considerable management skills are needed to market them successfully.

1.5 Regulatory framework for an integrated health and food policy environment

In Canada, industry, health organizations, government and civil society groups agree on the need to ensure a safe and nutritious supply of food. But opinions vary on how best to achieve this goal. This report does not "take sides" on these matters, but does explore the role of government in regulating the agrifood and health interface.

2 A Conceptual Framework for an Integrated Agrifood and Health Policy in Canada

2.1 The OECD view on integrated food policy – a 1980s perspective

In 1981, the Organisation for Economic Co-operation and Development (OECD)[8] published a landmark report on the concept of an integrated food policy. It noted that by attaining a higher standard of living, developed nations have just as much opportunity to worsen their diet, and thus their health, as improve it. But the report also suggested that governments, as they became more sensitive to the "food policy" concept, would give dietary issues greater prominence, especially if health costs could be lowered via a healthier population.

The report observed that a fragmentation of responsibilities among ministries responsible for the food economy encourages narrow and partial approaches. As a result, conflicting policies could arise in the same government. Policies could be developed to encourage the production of certain commodities, even as other policies are recommending decreasing consumption of those commodities. This fragmentation results in competition among ministries for scarce budget resources, and prevents governments from taking a "big picture" perspective.

Innovative for its time, the report's principal findings have not lost their relevance. Canada in 2007 faces the same major issues that the OECD identified in 1981: a wealthier population that isn't necessarily getting healthier – in fact increasingly out of shape and even obese – and government ministries working potentially at odds and largely in isolation from one another. Meanwhile, Canada is struggling to improve farm incomes and cope with high and increasing health costs. Solutions must be found; an integrated agrifood and health policy would certainly be one of the measures that could benefit the agriculture industry and the diets and health of Canadian society.

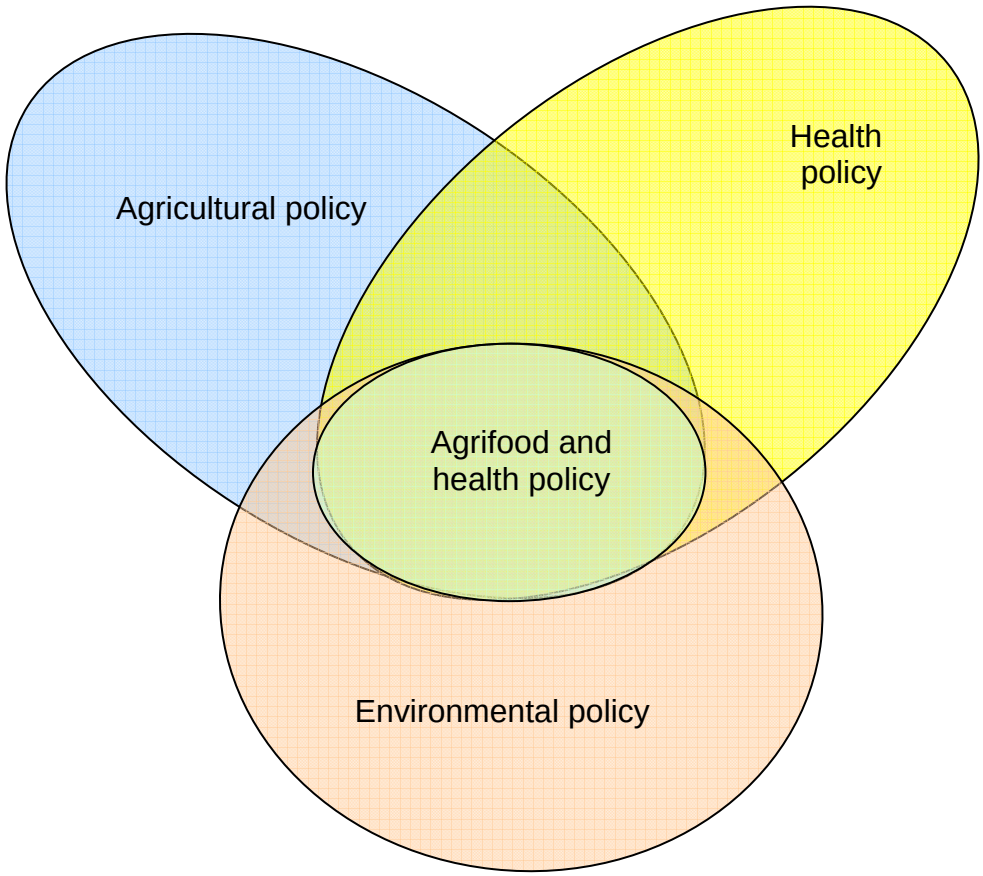
2.2 Objectives and key principles for an integrated food and health policy

An integrated agrifood and health policy should seek to improve the health of the country's population, while strengthening the economic wellbeing of the agriculture and food

[8] OECD 1981.

sectors. The goals of this policy should be strategic and achievable, while accounting for Canada's economic and social realities. In its initial deliberations, the project team for this project considered, but rejected, various existing frameworks for developing an integrated agrifood and health policy. Initially, a health and agriculture matrix (see Appendix B) was envisioned which the project team realized would be too analytically complex. In addition, the matrix didn't lend itself to an integrated synthesis, but rather a fragmented "silo" approach. The project team also looked at a framework developed by the Robert Wood Johnson Foundation (see Appendix C), but concluded it was also too complex. Conceptually, the project team visualized an integrated agrifood and health policy as the intersection of agricultural policy, health policy and environmental policy. Figure 3, which depicts the concept, is modified from Meyer-Ploeger[9].

Figure 3



The agrifood and health policy envisioned in the above graphic should include the following five components:

- **Strategic collaboration:** Meaningful collaboration takes place among the stakeholders in agriculture, food and health. This can be interdepartmental within a government, across

[9] Meyer-Ploeger 2005

different levels of government, internationally, and with the participation of industry, health organizations, research organizations and the public. Collaboration goes beyond perfunctory "consultative exercises," and includes the setting of goals and objectives, synergistic research collaboration, as well as "ownership of the policy" and resource commitments.

- **Regulatory and economic framework:** There is a clearly defined set of regulations, guidelines and economic incentives that are specifically intended to support the objectives of the integrated agrifood and health policy. At the same time, regulations and incentives that serve as barriers to integrated food policy are reduced or eliminated.

- **Population health and education:** Population health is focused on the growth and development of an understanding of the health of individuals and communities. A "population health strategy" is one that reduces disparities among individuals and groups and improves the health of all sectors of the population. As well, an integrated agrifood and health policy should include specific activities directed toward educating government, politicians, industry, and the public. These activities should acknowledge the "win win" potentials of healthier individuals and a healthier population.

- **Monitoring and evaluation:** Once integrated policies are initiated, an independent body should undertake monitoring and data collection to assess the policies' impacts. These evaluations should be performed regularly. The evaluations should identify how well the policy is working, so reinforcement and remedial action can be taken by those responsible for the policy.

- **Research and innovation:** The policy should be underpinned by strategic and focused multidisciplinary research and knowledge transfer/exchange programs aimed at achieving the goals of the policy. Attention should also be focused on enabling information to allow for innovative product and technology development.

3 Background – Evolution of Canadian Policy

3.1 Evolution of agriculture and food policies in Canada[10]

In Canada, agricultural policies have emerged largely as pragmatic responses to specific problems and issues within the industry. Some policies have come about through a logical decision-making framework, while others have been initiated as a matter of political expediency. The formation of the 2002 Agricultural Policy Framework (APF) marked the first genuine attempt to create a comprehensive, overall plan for agricultural policy. The next generation of the

[10] Tyrchniewicz and Tyrchniewicz 2005

APF, titled *Growing Forward*, is currently under development. But it's too early to tell if this policy will truly become a master plan for agriculture.

In the history of agricultural policies, a number of key threads arose that persist to the present day:

- Before Confederation, agriculture was not export oriented. The new territories exported fish, timber and furs, but not agricultural products. In fact, Canada was a food deficit region; England and France wanted the territories to move toward food self-sufficiency.

- Following Confederation, agriculture was seen as an instrument of national development, a source of cheap food for the population, and a market for manufacturing industries. For the most part, farmers were left to work out their problems in a largely open market environment. These circumstances gave rise to the cooperative movement, especially in Prairie Canada, where farmers felt that they were at the mercy of powerful grain companies and railways.

- The economic hardships of the Great Depression caused many to challenge the suitability of free markets and their implications for farm income. It became apparent that public policy had a role to play in farm incomes and stability, and in farm expansion and productivity. A number of emergency relief measures were introduced that still exist today, such as the pooled marketing of wheat through the Canadian Wheat Board and conservation measures through the Prairie Farm Rehabilitation Administration (PFRA).

- During World War II, agriculture was used to serve the demands of the war effort. This period saw the introduction of policy instruments – besides just price incentives – to influence agricultural production decisions (e.g., controls on wheat acreage and feed freight assistance to encourage livestock production in feed deficit regions). Many of these "emergency war time" measures persisted for decades.

- Post-war agricultural policies have been characterized by a tangle of the threads from the past, constrained by structural and regulatory rigidities, and often driven by the philosophical leanings of the Minister of Agriculture of the day. Farm policy debates became bitter and divisive; policies and programs were considered ineffective in addressing the fundamental problems of low and unstable incomes in agriculture.

In September 1967, the Government of Canada established the Task Force on Agriculture. It was mandated to assess agricultural goals and policies in Canada. The task force consulted widely, and submitted its report in December 1969. The report had over 180 recommendations, covering nearly every aspect of the agricultural industry. Some of the major recommendations, particularly those relating to the grain industry, formed the basis for far-reaching policy changes. However, many important and pressing recommendations were not implemented.

One of the recommendations advised broadening the mandate of the then-Federal Department of Agriculture to reflect agri-business and food systems developments. This recommendation was never adopted, primarily because of the farm politics and bureaucratic rigidities associated with

the traditional system. Notably, many recommendations which appeared to be justified on purely economic grounds were not implemented, primarily because agricultural policies generally take into account many other considerations, namely jurisdictional, political and social factors.

These events and circumstances revealed serious shortcomings and weaknesses in existing agricultural policies and programs. Despite large, ad hoc expenditures on agriculture, farmers were dissatisfied that a growing portion of their income came from impromptu government payments. Meanwhile, facing growing budget deficits, neither federal nor provincial governments appreciated these sudden, unforeseen expenditures. Worse still, the ad hoc programs were costly, inefficient, cumbersome, complex and replete with political controversy. With both the federal and provincial governments suffering budgetary constraints, it was unfeasible to try to "buy out" problems in agriculture. Solutions would have to be found within greatly constrained financial resources.

In 1989-90, these circumstances led to the establishment of the National Agricultural Policy Review. The review's first milestone was the release of a major discussion paper entitled "Growing Together – A Vision for Canada's Agrifood Industry." After broad-ranging consultations and many task forces, the essence of the policy emphasis was essentially the following: reduce production costs, dispense with regulatory burdens, remove inter-provincial trade barriers, and reduce the patchwork of provincial stabilization programs.

The policy reviews of the late 1980s and early 1990s produced several significant insights. These included:

- Domestic agricultural policy issues cannot be dealt with in isolation from international agricultural trade policies;
- It is not possible to deal with farm policy issues in isolation from macroeconomic policies, such as monetary policy, interest rates and foreign exchange rates;
- The constituency for farm policies has changed drastically over the last several decades. Farm organizations have become more commodity-and region-specific, making the development of a consensus across commodities at the national level more difficult. Other interest groups, including consumers, lenders, processors, input suppliers, transporters and environmentalists, wanted to be part of the process of policy development.
- The concentration of production and processing was altering the structure of the agricultural sector. For example, in the grain sector, 20% of the producers grew 80% of the crop commodities, and the handling of grain was consolidated in the hands of fewer grain companies. Many of these companies were multi-nationals, as opposed to the farmer-owned cooperatives that characterized traditional agriculture in Canada.

In the mid-1990s, Canadian agricultural policies moved toward reduced levels of support and a greater market orientation. This trend occurred in tandem with the 1995 implementation of the Uruguay Round Agreement on Agriculture. A number of key changes occurred, such as:

- A shift from commodity price support to whole farm income stabilization;
- Decreased use of subsidies for inputs and services;

- Enhanced support for farm investment and diversification;
- The demise of export grain transportation subsidies (the "Crow rate"); and
- New emphasis on cost-sharing measures among governments and producers.

Throughout the 1990s, federal and provincial Ministers of Agriculture sought to achieve a program set that would lead to more stable and predictable expenditures, as well as protection against continuous ad hoc demands. The current whole farm programs are meant to be responsive to all risks in income variability. But a weakness of these programs is that they cannot, in fact, respond to the level-of-income issue. The question is: should they be expected to deal with the level-of-income issue?

In the 21st century, Canadian agriculture has thus far faced predicaments similar to those that plagued the sector for much of the post-World War II period. This scenario is particularly applicable to primary producers. The APF, and its next version, *Growing Forward*, is the latest government attempt to deal with these predicaments. In June 2001, federal, provincial and territorial ministers of agriculture, in consultation with industry representatives, articulated a new vision for Canadian agriculture. They advocated securing the long-term profitability of the sector by making Canada the world leader in food safety, innovation and environmentally responsible agricultural production.

In 2003, Canada's federal, provincial, and territorial governments agreed to a five-year strategy, the APF, aimed at creating a national approach to agriculture. In contrast to previous policies, the APF focused not just on the agriculture sector but the role of the value-chain and post-farm gate activities. The APF has five core pillars: business risk management, food safety and quality, science and innovation, environment, and renewal. Two of these pillars relate to food industry and market issues: food safety and quality, which seeks to increase consumer confidence in Canadian agrifood products, and science and innovation, which seeks to create opportunities for food and non-food innovation and commercialization.

In April 2005, the Ministers of Agriculture established the APF Review Panel. The panel completed its review in June 2006[11]. Since most elements of the APF expire in 2008, consultations are underway regarding the next generation of Canadian agricultural and agrifood policies. This next generation of the APF, *Growing Forward*, is under development and forms the basis for federal, provincial and territorial governments to work toward a new agricultural policy framework. In June 2007, the federal, provincial, and territorial agriculture ministers agreed in principle to the *Growing Forward* document. The ministers also agreed to business risk management programs that will help deal with both production risks and financial risks.

Canada's agricultural history is characterized by many policy reviews and debates. Yet some issues never seem to have been addressed, such as: inter-provincial trade barriers inherent in supply managed commodities, continuing differences among provinces in regulations governing trans-border transportation, and ambivalent positions among commodities in international trade negotiations. Unfortunately, in the evolution of Canadian agricultural policy, it is clear that one area in particular has never been a high priority, if mentioned at all: food and health issues.

[11] Tyrchniewicz 2006

3.2 Evolution of health and nutrition policies in Canada

Canada lacks a formal, integrated nutrition policy. However, over the years, the federal government has worked with the provinces and municipalities to put in place different policy elements that together could be thought to constitute a nutrition policy. These elements include laws, rules, regulations, policies, programs, and interventions.

Since the mid-1900s, health policies in Canada have concentrated on population health and reducing social inequalities. In the first half of the 20th century, health policies focused on the prevention of deficiency diseases. During the 2nd half of the century, the emphasis shifted to health promotion and the prevention of chronic diseases.

In 1974, the federal government published a milestone report that set a new direction for health care policies. Called "A New Perspective on the Health of Canadians," or the Lalonde Report,[12] it identified two key health-related objectives: the health care system, and the prevention of health problems and the promotion of good health. The report set the stage for the 1990 publication "Nutrition Recommendations for Canadians," which re-focused the attention of the health care community from the prevention of deficiency diseases to the role of the diet in chronic disease prevention. The recommendations spelled out the desired characteristics of the Canadian diet: energy consumption for a healthy body weight; recommended levels of all essential nutrients; and focusing on the consumption of total and saturated fat. These recommendations led to the 1992 publication of "Canada's Food Guide to Healthy Eating." The guide recommended that Canadians consume fruits, vegetables, cereals, breads and other grain products. It urged people to eat a variety of foods, and to choose lower fat animal foods (dairy products and meats). The guide also recommended that Canadians strive to maintain a healthy body weight.

In 1996, a document was published that is generally regarded by Health Canada to be the first comprehensive nutrition policy statement in Canada: "Nutrition for Health: An Agenda for Action." The statement acknowledged that food availability and choices are greatly influenced by the combination of powerful economic and social forces and individual tendencies and capacities. The policy statement advocated the integration of nutrition into social and economic policies and programs, as well as programs related to health, agriculture, and education. In 2007, Health Canada integrated this nutrition policy into a revised food guide, called "Eating Well with Canada's Food Guide."

3.3 Evolution of dietary fat policies and programs in Canada[13]

In Canada, the evolution of policies and programs related to dietary fat is a classic example of how the government and industry have addressed food and health issues. In 1988, after a major conference on cholesterol, Canada launched a series of programs and initiatives aimed at reducing total and saturated fat consumption in order to reduce cardiovascular disease among

[12] Lalonde 1974
[13] See McDonald, Dubois and Sonntag 2007 for details and complete references

Canadians. This initiative was led by government (viz., Health Canada and AAFC), and received widespread support from food processors and manufacturers, producers, non-governmental agencies (e.g., Heart and Stroke), clinicians, academics and consumers. A summary of this initiative may provide a useful reference point for the development of an integrated agrifood and health strategy in Canada.

Since the 1960s, medical experts in the developed countries have expressed concerns about the high incidence of cardiovascular disease (CVD) and the relationship of coronary heart disease (CHD) to the amount and type of fat in people's diets. This concern was reinforced by a major study – called The Seven Countries Study – on the relationship between dietary fat intake, blood cholesterol levels and the incidence of mortality due to CHD. In addition, metabolic studies that quantified the relationship between saturated fat and blood cholesterol reinforced the concern about the amount of fat, particularly saturated (viz., animal) fat, in people's diets.

The 1980s saw the emergence of consensus conferences on cholesterol. These conferences stimulated consumer concern about the relationship of dietary fat to the risk of CVD, and public interest in the policies and programs that could address this issue. The first such Cholesterol Consensus Conference occurred in the US in 1984. This conference prompted the National Heart, Lung, and Blood Institute (NHLBI) to launch the National Cholesterol Education Program (NCEP) in 1985. Canada held its own Consensus Conference on Cholesterol in 1988. It was sponsored by the federal government, non-government health agencies, and industry. The conference produced dietary recommendations similar to those articulated previously by experts in the US and Europe. The primary recommendations called for:

- a reduction in total fat to 30% or less and saturated fat to 10% or less of energy intake;
- protein in the range of 10 to 15% of energy intake; and
- the balance of the energy from carbohydrate (with an emphasis on a variety of foods containing dietary fibre).

The conference's expert panel concluded that the agriculture and food industry should work harder to produce foods that would help lower blood cholesterol in the Canadian population. The panel also recognized the need to develop comprehensive dietary guidelines for Canadians which would help reduce the risk of CVD. Specifically, these guidelines needed to advocate a reduction in total and saturated fat intakes. The panel recommended that government agencies at all levels (federal, provincial and local) and voluntary agencies prioritize the development of health promotion programs.

After the conference, the federal government, industry, and health agencies undertook numerous activities to reduce total and saturated fat in the Canadian food supply. Some of these programs pre-dated the conference. For example, for several years, Health Canada had been considering developing nutrition guidelines and nutrition labeling, while Agriculture and Agri-Food Canada (AAFC) had been investigating beef and port grading standards aimed at increasing lean yields. The Consensus Conference on Cholesterol and the resulting consumer interest accelerated these initiatives. Food manufacturers agreed to help lower blood cholesterol by substituting partially hydrogenated vegetable oils (PHVO) for saturated fats in their formulations and by developing a host of low-fat and fat-free foods. PHVO, which contained varying levels of trans fat, also

replaced saturated fats in deep-frying uses (fast food preparation and snack foods such as potato chips). However, the prevailing science at the time held that trans fat (in an average diet) had little to no effect on CVD risk.

Although Health Canada and AAFC have both worked to reduce CVD risk among Canadians, they do not seem to have cooperated in any meaningful way. AAFC played a central role in the development of beef and hog grading standards aimed at reducing the fat, and increasing the lean content, of carcasses. Health Canada, in turn, concentrated on developing policies and programs to prevent chronic diseases, in particular heart disease.

AAFC was also instrumental in the development of canola, a vegetable oil crop well suited to Canada's climate and agricultural practices. It made major contributions to the development of canola cultivars and to the establishment of the nutritional properties of canola oil through in-house programs by supporting research at Canadian universities, the National Research Council and by the food processing industry. The Department also provided significant resources for the Canola Council of Canada's successful application for GRAS (Generally Recognized as Safe) status in the US.

Historically, chronic diseases did not become a significant priority in Canada until the 1970s. Previously, nutrition recommendations were focused on the prevention of nutrient deficiencies. However, the 1970-1972 Nutrition Canada Survey revealed that nutrient deficiencies were no longer an issue for Canada. Chronic diseases had replaced infectious and deficiency diseases as the main causes of morbidity and mortality. Yet an official policy for a Canadian diet that would help reduce the risk of chronic diseases did not appear until the 1992 publication of "Nutrition Recommendations for Canadians." As with the 1988 Cholesterol Conference, this publication recommended that individuals derive no more than 30% of their energy intake from fat, and no more than 10% from saturated fat. The nutrition policy included a companion publication, called "Canada's Guidelines to Healthy Eating," which recommended that Canadians choose lower fat dairy products, lean meats, and foods prepared with little or no added fat. Over the next 15 years, Canada introduced regulations for nutrition labeling and nutrition claims, which were aimed at facilitating these nutrition regulations and dietary guidelines.

The recently released food guide, called "Eating Well with Canada's Food Guide," lists for the first time both trans fat and saturated fat as risk factors for such chronic diseases as cardiovascular disease. However, Canada has been slow to address trans fat issues. In 1990, literature was published describing the adverse affect of trans fat on CVD, but mandatory labeling of the trans fat content in foods was not implemented until December, 2005. By contrast to Canada and elsewhere, the Danish government and Danish margarine producers reacted to the trans fat issue in the early 1990s. Danish margarine manufacturers agreed in the mid-1990s to voluntarily reduce the industrially produced trans fat content of their products. However, a review in 2001 concluded that this measure had little impact, and so in 2004 the government passed legislation prohibiting the use of industrially produced fats and oils containing more than 2% of trans fat. In 2006, analyses found that these foods, which had been significant sources of trans fat, were virtually free of it. Still, even after reducing the trans fat in foods sold in Denmark, international fast food companies continued to sell these foods elsewhere with the same high levels of industrially produced trans fat.

Canada also considered eliminating, or substantially reducing, the trans fat in foods sold domestically. In 2006, a Trans Fat Task Force recommended that Canada limit to 2% or less the trans fat in vegetable oils and margarines sold to consumers or used on-site by retailers or food service establishments, and recommended that trans fat in all other foods be reduced to 5% or less of total fat. In 2007, the Minister of Health gave the food industry notice that it had two years to voluntarily implement these measures, or the government would regulate this reduction. The government didn't immediately implement the recommendations, since trans fat levels in the Canadian food supply had already decreased significantly over the previous decade. The task force consisted of representatives of AAFC, other federal government departments, industry, academia, consumer groups, and health organizations.

Canada has also made progress in labeling. In 1988, after five years of consultations, Canada introduced a voluntary nutrition labeling system, with a special emphasis on information pertaining to fat. The legislative changes permitted nutrient content claims (e.g., suggesting the food is "a good source of fibre" or is "low in saturated fat") and nutrition information tables (i.e., amount of energy, protein, fat, and carbohydrate per serving). However, it did not permit health claims (e.g., suggesting the product contributes to a healthy diet low in saturated and trans fat and reduced risk of heart disease.). In 2005, Canada implemented mandatory labeling, several years later than the U.S., which brought in the Nutrition Labeling and Education Act in 1994.

Two indicators can be assessed in order to determine the impact of the policies, programs and practices (e.g., changes implemented by the food industry) that followed Canada's 1988 cholesterol conference:

- Changes in the intake of total and saturated fat;
- Changes in the pattern of mortality associated with cardiovascular disease.

During the 1990s, apparent total fat intake increased appreciably among Canadians. This trend occurred despite efforts to encourage consumers to reduce fat intake – especially saturated fats – by Health Canada, health agencies, and the food companies that developed low-fat and fat-free alternatives. Canadians' total energy intake also increased significantly. Hence, fat intake, as a percentage of energy intake, remained relatively constant at 35-36% of total calories. Notably, the increase in fat intake was associated with a marked increase in consumption of salad oil.

In the past five years, however, total apparent fat consumption has decreased by about 6.5%, largely because of a decrease in consumption of margarine and shortening and shortening oils. Saturated fat intake has also decreased, but modestly (0.8 g/person/day or 0.3% of calories). Unfortunately, the decreased consumption in saturated fat arising from less use of butter, margarine and shortening have been largely off-set by a substantial increase in the consumption of creams and cheeses. For example, a six-fold increase has occurred in the consumption of table cream (0.35 to 2.10 litres/per/yr), mostly thanks to Canadians' dramatically higher consumption of coffee.

Overall, it is difficult to estimate trends in trans fat intakes. Once Canada announced mandatory labeling of trans fats, snack food manufacturers and food service companies switched their deep

frying operations from partially hydrogenated frying fats to mid- and high-oleic acid vegetable oils (viz., mid-oleic sunflower and low-linolenic, high oleic canola). Many foods have experienced major reductions in trans fat content over the past decade and even the past two years. Meanwhile, rapid increases have occurred in the market share of trans free, non-hydrogenated margarine. However, Canada and most countries (excluding Denmark) were slow to react to scientific evidence pointing to the adverse health impacts of trans fat. As well, food products of the same category vary widely in trans fat levels (e.g., soft margarines can vary from 0 to 40 g trans fat/100g). Statistics Canada does not include trans fat in its food survey data.

In the past 20 years, Canada has seen a dramatic, and nearly linear, decrease in mortality rates for diseases of the circulatory system. This trend is partly due to better medical treatment and reductions in smoking. Nevertheless, deaths from diseases of the circulatory system remained the leading cause of mortality for both men and women, at 311 per 100,000 people. In 2002, 32% of all male and 34% of all female deaths were due to diseases of the circulatory system. Coronary heart disease accounted for 54% of all cardiovascular deaths, stroke 21%, other forms of heart disease 16%, and vascular problems (such as high blood pressure and hardening of the arteries) accounted for 9 percent. Between 1979 and 2002, deaths due to heart attacks (ischemic heart disease) decreased from approximately 330 to 106 per 100,000 people, and to 96 deaths per 100,000 by 2004 (the last year for which Stats Canada gives mortality data). Other heart diseases contributed another 30 deaths per year per 100,000 people. However, deaths due to congestive heart disease have not changed appreciably over the past 25 years. Mortality due to strokes also has decreased over the past 25 years, but much less dramatically than for heart attacks.

Experts cannot readily assess the extent to which the decrease in mortalities from diseases of the circulatory system is due to the diet, and in particularly decreased consumption of saturated fat and trans fat. Improved medical treatment is probably a major contributor. Other lifestyle changes besides diet, such as the decrease in smoking, undoubtedly have contributed to the reduction in cardiovascular deaths. Furthermore, any contributions to the decrease in CVD mortality as a result of changes in the amount and type of fat in the diet may have been offset by the marked increase in obesity and diabetes. Both of these occurrences have been shown to have a major impact on CVD. However, these are recent phenomena. Diseases of the circulatory system develop over a long period of time. Therefore, it will take a number of years to determine whether the decreased consumption in total or saturated and trans fat can be credited with any improvements in mortality, especially in view of the confounding effect of increased obesity and diabetes.

4 A Review of Selected Approaches and Initiatives for an Integrated Agrifood and Health Policy

The project team conducted a ‘scan’ of existing agrifood and health policies in selected European countries, the US, and Canada. The objective was to identify initiatives that benefit the health of a country’s citizenry while improving the prospects for the agrifood sector. The scan revealed that no ‘magic bullet’ exists in devising an integrated policy. However, numerous examples of recent initiatives exist that can help Canada chart a path toward an integrated strategy. The

examples the team found each answered several of the following questions (although none provided enough detail to answer them all):

i. Why was the action taken? e.g., the purpose/goals of the initiative as articulated at its inception
ii. What was done? e.g., process, procedure, action taken
iii. Who provided the impetus (the Driver) e.g., Government, Health community, Health professional, Producers, Processors, Distributors, Consumers
iv. Was any particular group the focus? e.g., Age, Gender, Location, Ethnic group etc.
v. What were the health outcomes? e.g. conditions associated with improved rates of cancer, diabetes, heart disease and strokes
vi. What were the outcomes for the agrifood sector? e.g., changes in demand or prices, new horizontal or vertical arrangements that increase sustainability of a product group
vii. Were there unintended consequences? e.g., actions taken to improve the health of the population that had an impact (positive or negative) on the agrifood sector or vice versa
viii. What were the success/failure factors for the initiative? e.g., the players, the focus on problem solving, a shared knowledge base
ix. What did we learn? e.g., approaches that can be implemented directly, activities that have succeeded in one area that could apply in another
x. What were the costs of implementing the initiative? e.g., to whom and how were they met
xi. Baseline information e.g., length of the study, number of participants, communications vehicles etc.

4.1 International initiatives integrating agrifood and health policies[14]

Based on examples in Europe, the US, and Canada, the project team identified five key components that could contribute to the development of an integrated agrifood and health policy: strategic collaboration, a regulatory and economic framework, population health and education, monitoring and evaluation, and research and innovation. This section of the report describes how projects in each country or region used these components to produce an integrated policy. Few projects used only one component, but usually two or more in combination. The projects are categorized here according to the component they employed the most. Europe and the US are described together, and Canada separately. Notably, most of the integrated policies are focused on health and food issues alone, excluding agriculture all together.

In general, strategic collaboration has emerged as a prominent theme among projects in the Nordic countries (Finland, Sweden, and Norway), as well as England and Scotland. Finland achieved significant improvements in its citizens' eating habits. In Scotland, the lack of strategic collaboration contributed to the general failure of its integrated strategy. The US has introduced projects focused on strategic collaboration, economic incentives, the promotion of population health, and research and innovation. In particular, its program targeting pregnant women, infants

[14] For more details see Henson et al 2007.

and children (WIC) met with considerable success. Germany has placed its greatest emphasis on policies geared to the population and health of individuals and communities, and on education and marketing. This approach proved successful, in particular, in the school system. The EU and WHO have also placed a high degree of emphasis on these two areas, as did the International Fruit and Vegetable Alliance (IFAVA), which saw increases in the fruit and vegetable consumption of their members. Monitoring and evaluation were emphasized to some extent by the EU and Scotland, while research and innovation have been emphasized somewhat by the EU, Sweden, and the US.

4.1.1 Strategic collaboration

Strategic collaboration is essential to integrating agrifood with health policies. Initiatives that failed to include strategic collaboration often failed all together. Notably, most of the examples the project team examined that were based on strategic collaboration involved a multitude of agencies, but failed to engage the agriculture sector for varying reasons. Strategic collaboration has been emphasized by the EU, as well as several countries including Norway, Finland, Sweden, England, Scotland, and Germany.

In March, 2005, the EU launched a platform on "Diet, Physical Activity and Health." The project has brought together industry, consumer groups and health experts to find ways to combat obesity. Its emphasis is on self-regulation and voluntary commitments from stakeholders. Within their areas of work, the platform's members have vowed to help combat obesity. The UK is the only EU member state whose government is directly involved in the platform. The majority of commitments have been made by three groups: food and beverage manufacturers; medical, health, nutrition and sport and leisure organizations; and wholesale and retail organizations. The EU has chosen to focus on an approach of self-regulation and voluntary commitments until 2009/10. Further steps will be decided once the platform's performance has been assessed.

Among European countries, Norway provides one of the earliest examples of an integrated strategy. In 1975, Norway launched a Nutrition and Food Policy. It was designed to combat the country's high incidence of cardiovascular disease, which accounted for about half the nation's deaths[15] . The main goal was to reduce the proportion of fat in the diet from 40% to 35% of the energy supply, a goal first achieved in 1991[16] [17]. Norway's example is one of the few that included the agricultural community. The farm lobby saw the value of adapting to the emerging diet-health paradigm and helped introduce an effective national food policy, linking together policies on agriculture, food processing, consumers, health and rural affairs[18],[19] .

Strategic collaboration was also central to initiatives in Finland. The Finnish government worked with the country's health services to combat poor dietary behaviour. In the early 1970s, Finland

[15] Norum 1997
[16] National Nutrition Council 1994
[17] Helsing 1993
[18] Helsing 1987
[19] RNMA 1975

had the highest recorded coronary mortality rate in the world[20]. The North Karelia project in Finland targeted smoking, blood pressure control and diet, and preventative activities throughout the country. Over two decades, the dietary intake of Finns recorded a significant increase in vegetable consumption, even to the point of doubling in a single decade[21]. Meanwhile, the proportion of saturated fats in total fat consumption declined, while fish consumption rose. These and other dietary shifts were generated by public policy support. The health agencies worked with the food industry to alter the food supply, thereby linking the push of supply with the pull of demand. A 55% decline in male mortality from coronary heart disease, for example, has been recorded in the period of 1972-92. Changes have been even greater for women[22]. The secret was close integration between health agencies and other agencies. For example, once dietary guidelines were designed for schools (for use in lunches), guidelines were developed and implemented for other social groups ranging from day care facilities to the elderly to the armed forces. This strategy was rolled into a systematic, planned approach with a clear overall vision.

In the 1990s, Sweden launched an attempt to integrate public and environmental health with employment and food quality objectives, following heavy criticism about monoculture in forestry and farming[23]. Both the Agriculture and Environment ministries are developing programs to reduce fossil fuel and energy use and to meet health targets[24]. This is based on the Factor Four approach of the Club of Rome, which calls for trying to reduce the resources needed to produce goods by a factor of four through increasing technological sophistication[25]. As a country, Sweden has a plan to halve resource use by 2021[26]. Sweden is also exploring how to achieve tough targets on reducing greenhouse gases emitted from the entire food supply chain[27].

In England, strategic collaboration has figured prominently in efforts to integrate agrifood and health. These initiatives came about largely as a result of the BSE scares of the 1980s and 1990s and the foot-and-mouth disease outbreak in 2001. In 2001, the government established an independent commission (Curry Commission) which recommended that in order to develop a new agriculture and food policy, several departments and agencies should coordinate their activities: the Department for the Environment, Food and Rural Affairs (DEFRA), the Food Standards Agency (FSA) and the Department of Health, the food sector, public procurement agencies, and the Department of Education and local education authorities. Simultaneously, England performed an economic analysis of the agrifood sector that led to the launch, in 2002, of the Strategy for Sustainable Farming and Food (SSFF). The strategy is designed largely to foster a sustainable farming community and the production of safe and nutritious food products.

In 2006, the SSFF Implementation Group published a progress review. It highlighted areas in which specific actions under the SSFF had been achieved, including: the implementation of an Environmental Stewardship Scheme; the adoption of a whole farm approach in regulating agricultural production; and the development of sector and issue-specific ‘daughter strategies’

[20] Pietinen 1996
[21] National Nutrition Council 1992
[22] Pietinen 1996
[23] Vail 1994
[24] Commission on Environmental Health 1996
[25] von Weizacher 1997
[26] Swedish Environmental Protection Agency 1999
[27] Carlsson-Kanyama 1998

(e.g., the Animal Health and Welfare Strategy, the Food Industry Sustainability Strategy and 'Choosing a Better Diet'). The review identified several key challenges, including: the need for more effective communication and coordination of the strategy among stakeholders, the critical role of leadership in key stakeholder groups, the need to prevent the SSFF from being seen solely as an 'agricultural' policy, and the importance of maintaining strong governance over the strategy and its implementation, even while working through local delivery. It is too early to judge whether the SSFF will achieve its defined outcomes and impacts. However, it does illustrate one of the popular ways other countries are attempting to create integrated policies.

In Scotland, a 10-year integrated strategy was launched in 1996 that failed largely because of the absence of strategic collaboration. The Scottish Diet Action Plan (SDAP) called for a systematic approach to food and health policy. Increasing the consumption of fruit and vegetables became the main goal. Scotland has a history of poor diet and diet-related health problems. It has one of Europe's highest mortality rates from heart disease, and obesity is at the forefront of current health concerns. The strategy emphasized that changing Scotland's diet and food culture would require a coordinated, partnership approach between government public services, consumers, farmers, and others in the food supply chain. Nevertheless, in 2004 a review panel found that the plan's goals had mostly fallen short. For example, no increase occurred in the per-person daily intake of fruit and vegetables or in the consumption of oil-rich fish or breakfast cereals. Sugar intake actually increased, while no reduction occurred in the intake of complex carbohydrates. A major cause of these shortcomings was the plan's failure to engage the food supply chain. The plan adopted a wholly consensual, partnership approach to 'working with' the food industry and thus underplayed the powerful role of the food supply chain in shaping food content, access, availability and consumer demand over the 10-year period. The plan did not account for the way the powerful marketing and advertising of the food and drink industry could undermine health messages. Institutions and leadership across the supply chain were not aligned effectively. At the producers' end, no reduction occurred in the production of dairy fat and no alternative, non-food markets were found for butterfat. Nor was the sugar and fat content in processed foods and drinks reduced. No basic training occurred in nutrition for people working in the food industry and the hospitality management curriculum. The plan fell short in increasing consumer demand for fruits and vegetables, whether through primary producers or the catering service.

The review panel found that the plan failed to influence the country's agricultural sector. In fact, since 1993, the area devoted to growing soft and orchard fruits and vegetables has declined even though Scotland has favorable conditions for growing a wide variety of fruits and vegetables. The plan made a number of recommendations to stimulate consumer demand for fruits and vegetables. Yet these recommendations were not transferred into policies on agriculture and farming. No action to prioritize fruits and vegetables were included in the Scottish Executive 2001 report, nor were fruits and vegetables included in Scotland's 2003 Organic Action Plan. The review recommended that, given the complexity of modern food systems, action must be coordinated across all levels of food governance, from local to international levels.

The review panel identified several over-arching themes that could guide Scotland's future food policy, including: increasing the integration between the policy goals meant to support Scotland's diet-related health initiatives and those of social justice, sustainable development, and agriculture; re-establishing the grounds for engagement with the food industry in Scotland so that

public health and sustainability are over-riding drivers of food production and supply; and developing new multi-level governance structures, institutions and leadership. The review argued that a policy commitment to food-related health improvement in Scotland must be renewed across all levels and sectors/departments. To achieve this goal, the review cited the examples of breastfeeding and tobacco control, where the government sent strong signals that health must be a priority (including legislative support).

In the US, a project was recently initiated by the Prevention Institute that advocates a "big tent" cross-sector collaboration approach to an integrated agrifood and health strategy. The objective of the Cultivating Common Ground project is to create a synergistic movement between the health sector and sustainable agriculture, and to build momentum for the development of a just, sustainable health-promoting food system. In particular, the project is focused on how to engage health professionals as advocates for sustainable agriculture. The project proposes the development of a leadership group of broad thinkers from the sustainable agriculture, health, environment, and social justice fields. The project has identified specific, targeted health outcomes, such as increasing access to healthy foods in neighborhoods and institutions, and protecting the health of farmers and agricultural workers.

4.1.2 Regulatory and economic framework

The integration of agrifood and health policies can benefit from a clearly defined set of regulations, guidelines and economic incentives that support the policy. This approach has been adopted to some degree by the European Union (EU), which has put several procedures in place so that health is considered in various policy areas[28]. For example:

- The EU has established a principle that EU policies should not interfere with policies that promote public health;
- A recent EU Common Agricultural Policy (CAP) reform largely decoupled support payments from the production of specific crops, thereby reducing the distortions in agricultural commodity price ratios;
- The supply management and production quota regimes for milk and sugar production are under continuous scrutiny for reform. In the past they have contributed to higher price levels in the EU than on the international market, thus having a dampening effect on consumption;
- In response to health, obesity and nutrition issues, changes to the EU CAP have been proposed in the Commission's White Paper on A Strategy for Europe on Nutrition, Overweight and Obesity related health issues[29]. The EU will promote children's consumption of fruits and vegetables by allowing surplus production to be distributed to educational institutions and children's holiday centers. Typically, surplus production of fruits and vegetables in the EU is destroyed to avoid prices falling below certain levels;
- The EU proposes to increase its co-financing to 60% for the promotion of health projects aimed at young consumers (children under 18).

[28] EU 2005: 5ff.
[29] EU 2007: 6

In Scotland, the review of the Scottish Diet Action Plan (SDAP) noted that the plan failed to deploy the full set of policy tools available, most notably the regulatory and legislative powers of government to control the food supply chain and help create demand. The panel recommended a greater use of regulatory powers and incentives in order to set goals for the food supply chain and to build consumer demand for healthy products.

In the US, economic incentives figured prominently in a population health policy introduced in 1972 to help pregnant women, infants and children (WIC). The program also involved extensive strategic collaboration. It is administered at the Federal level by the Food and Nutrition Service of the US Department of Agriculture (USDA). It is also administered by 90 state agencies, through approximately 46,000 authorized retailers. Most State WIC programs provide vouchers that participants use at authorized food stores. The WIC mission is to safeguard the health of low-income women, infants, and children up to age five who are at nutrition risk by providing: nutritious foods to supplement diets, information on healthy eating and food safety, and referrals to health care. Associated with the WIC program is the WIC farmers' market nutrition program. It offers a variety of fresh, nutritious, unprepared and locally grown fruits, vegetables and herbs to WIC participants (purchased with coupons).

The WIC program has been evaluated on different occasions, and has shown to have had a positive impact on pregnancy outcome and infant health. An early evaluation showed that women who participated in the program during pregnancy had lower Medicaid costs for themselves and their babies than women who did not participate in the program[30]. WIC participants were linked with longer gestation periods, higher birth weights and lower infant mortality. Several studies have confirmed these findings although the consensus favouring WIC has come under attack in recent years[31]. However, a recent study carefully designed to examine the criticism that the selection of WIC participants is biased not only refuted the claim but confirmed the perception that WIC works[32]. The study contributed a large body of work which suggests WIC participants are actually negatively selected from the eligible population and that the benefits to WIC participants (e.g., an average of nearly one night shorter hospital stay for infants and one-quarter night for mothers and 14% fewer infants who end up in the ICU) far outweigh the cost of the program.

In the US, regulations and economic policies figured prominently in the recommendations of a recent conference of experts on child obesity, nutrition, public health and agriculture. At the 2007 Wingspread Conference in Wisconsin, experts gathered to clarify the impacts of federal agriculture and food policies on public health, nutrition and obesity. They identified areas for policy analysis and research across agricultural, food, health and obesity-related issues, and developed obesity prevention recommendations related to federal agricultural and food policies. A major driver for the conference was the forthcoming 2007 reauthorization of the Farm Bill in the US, which is reauthorized every five years. The Farm Bill costs tens of billions per year, and includes not only crop subsidies but also funding for environment and nutrition programs and research. But only 8% of the research budget goes to research focused on improved health and

[30] Devaney B, Bilheimer L and Schore J. 1992
[31] Besharov DJ and Bermanis D. 2001
[32] Bitler MP and Currie J. 2005

nutrition; much potential exists to increase this emphasis. The conference made several broad-level recommendations, including: the development of a vision of health in agriculture; the generation of revenue (e.g. through taxes) to create a fund for the reduction and prevention of obesity and diet-related disease (as has been done for tobacco); and matching food marketing to children with equal funds to obesity and chronic disease prevention. Overall, the conference provided a rich resource for ideas that might be addressed with carefully selected components in an integrated food policy.

4.1.3 Population health and education

Across Europe, population health is a major component of integrated agrifood and health policies. These policies focus on individuals, groups, and local communities. Often, they are initiated hand-in-hand with education projects, and therefore the two components are grouped together in this section. Integrated policies should educate government and industry officials, politicians, and the public on the benefits of healthier individuals and healthier populations. This approach has been taken up by the EU, the World Health Organization Regional Office for Europe (WHO ROE), Germany, Scotland, and the US. As well, these components are emphasized heavily in the "5 a day" program adopted by numerous countries.

In recent years, the EU has undertaken several initiatives aimed at encouraging member states to adopt policies that promote healthy living at the local level. The EU is mandated by the Treaty of Amsterdam to ensure a high level of human health protection in the definition and implementation of all community policies and activities. The Commission sees its actions as complementary to the activities of member states, and focuses on initiating and standardizing information collection and coordinating trans-national activities. In 2000, the European Commission proposed a program of community action in the field of public health[33]. The program has three broad objectives: improving health information and knowledge; responding to health threats; and addressing health determinants (lifestyle, socio-economic factors, and the environment). In 2005, the EU produced a study on promoting healthy diets and physical activity[34]. The study highlights the structures and tools dealing with nutrition and health at the EU level. In 2007, the EU produced a strategy on nutrition, excess weight and obesity[35]. In the strategy, the EU pledges to promote children's consumption of fruit and vegetables and permit the distribution of surplus production to schools and children's holiday centres (rather than destroying surplus production).

The WHO ROE also emphasizes population health policies. In September 2000, the WHO ROE endorsed a five-year action plan for food and nutrition policies in European member states (53 countries and over 880 million people). A second strategy has been prepared for 2007-2012. It sets out a series of objectives, including the promotion of healthy lifestyles in Europe by improving dietary habits and encouraging physical activity. In particular, the strategy identifies the need to direct nutrition actions at the young, from the nutritional status of the mother to infant health to young people. With regard to agriculture, the WHO ROE strategy views this sector as

[33] EU 2000
[34] EU 2005
[35] EU 2007

essential to public health in terms of food supply, local availability, and safety and affordability. The strategy advocates: improvements in the food supply and food safety in public institutions, support for local horticulture, the reformulation of food products, programs to protect vulnerable groups, micronutrient fortification of staple food items, guidelines on the location and size of catering establishments and food retail shops, the use of economic tools (taxes, subsidies), adequate food regulations, good food hygiene from farm to table, food control systems (e.g. inspection services), and monitoring and surveillance systems for microbial and chemical hazards in the food chain and for foodborne diseases.

Among European countries, Germany has focused on targeted population health policies and education. In 2004, the country established a new program to promote healthy lifestyles in childhood development, including a balanced diet and exercise: *Plattform Ernaehrung und Bewegung* (PEB, Platform Nutrition and Activity). The activities under this program included: reaching children and parents in high risk groups, producing information and providing support for young parents, investigating food consumption patterns/habits, approaching pre-school day care and kindergarten facilities, approaching children directly, and supporting networks for nutrition and physical activity in local communities. A review of the program indicated that the collaboration of teachers and external experts is effective, and that health promotion should be an integral part of school development. However, the review did not reveal any significant connection between the PEB program and the agriculture sector. In 2007, Germany signed an international declaration (Badenweiler Declaration) aimed at improving its citizens' physical activity, increasing their consumption of fruits and vegetables, and instituting more healthy meals in schools, cafeterias, and retirement homes. These initiatives are intended to stop the increase in the rate of overweight children, and reduce the number of overweight people in Europe, by 2020. The chosen methods of achieving these goals include establishing healthy lifestyles as a social value, teaching facts about nutrition and physical activity, and preventing obesity in adults.

Scotland has also found population health and education policies to be effective. Although its 1996 Scottish Diet Action Plan was otherwise ineffective, the review of the plan found four areas of success: improving breast feeding rates and support for women of child-bearing age; improving food and diet in schools under the umbrella of the Scottish Executive's *Hungry for Success* initiative[36]; supporting community food initiatives; and producing health education resources and marketing campaigns. However, the review made no connection between these successes and the agriculture sector, even though in 2003 Scotland introduced a program to provide free fruit in all state primary schools.

In the US, two projects were recently initiated that target population health: Healthy People 2010 and Food for Health. The first project is working to identify the nation's most significant preventable health threats and focus public and private sector efforts to address those threats. It is supported by the US government through the US Department of Health and Human Services. The project has numerous targeted health outcomes: reducing obesity, maintaining a healthy weight, increasing the consumption of fruits, vegetables, and grains and reducing intake of saturated fat and total fat. In practice, the project seeks to make nutritional education part of a comprehensive school health education program. As well, it is encouraging food-related

[36] Scottish Executive 2003

businesses to help consumers achieve healthful diets by providing nutrition information about foods purchased in supermarkets, fast-food outlets, restaurants, and carryout operations. The project is encouraging policymakers and program planners at the national, state, and community levels to foster healthful diets and physical activity among the citizenry. In a separate initiative, the Sustainability Institute recently launched a project, called Food for Health, intended to create a transition toward the production of a healthier, more sustainable food supply. The initiative is supported by the private sector (e.g., Carrefour, General Mills, and Unilever) and civil society organizations (e.g., Nature Conservancy, Oxfam, and W.K. Kellogg Foundation). The project's objectives are to increase the availability of healthy and fresh foods in schools and healthcare facilities throughout Europe and North America. As well, the project seeks to build efficient and more sustainable supply chains for high quality healthy food – from local to international levels – creating genuine links between the producer and consumer and increasing access to products and markets for purchasers and suppliers. It will work to shift institutional food culture and public policy thinking so that healthy food is seen as essential to health and learning. The project is implementing pilot projects in major US and European cities. These projects are directed at accelerating the movement of healthy, locally produced, sustainable food to markets. A web-based collaboration and information exchange platform has been established for sharing best practices.

Population health is also a key focus of numerous "5 a day" programs. For several years, most advanced countries have operated programs to promote the consumption of at least five servings of fruits and vegetables per person daily. The CAPI project team reviewed initiatives in Australia, Canada, England and Germany. The focus for each country's initiative was on media campaigns and the widespread distribution of written information. Despite this effort, less than one-third of individuals in these countries eat the amount of fruits and vegetables recommended by their governments. Additional measures are needed to educate and motivate citizens to make healthier dietary choices. Five-a-day interventions need to go beyond increasing individual awareness. They should:

- target the family, local community, and overall society to eliminate barriers to increasing fruit and vegetable consumption;
- provide support for individuals who are making positive changes;
- increase resources for populations with budget constraints;
- recognize heterogeneity across individuals and cultural differences across communities;
- emphasize nutritional, health and agricultural policies that have an impact on the local communities; and
- build on strategic partnerships with private organizations, NGOs, producer associations and public sectors at the local, state, regional, and national levels to remove the barriers to a healthy lifestyle and opportunities to attain the "5 a day" goal.

The project team also reviewed the "5 a day" program sponsored by the International Fruit and Vegetable Alliance (IFAVA). The participants include Argentina, Australia, Canada, Chile, China, Denmark, France, Japan, New Zealand, Peru, South Africa, and the United States, plus the American Cancer Society (US). The review demonstrated the benefits of focusing an integrated strategy on individuals and communities. IFAVA members have largely experienced increases in fruit and vegetable intake. They undertook several successful local strategies,

including developing a school culture that focuses on healthy eating and healthy choices. The school project includes role modeling vis-à-vis teacher/staff participation, and changing the environment to yield more immediate behavior changes. Changing the school environment was found to be less expensive, less labor intensive and more effective than nutrition education. The research also revealed some notable barriers. Freshfel Europe, which acts as a forum for the European fresh fruits and vegetable chain, noted major obstacles to increasing fruit and vegetable demand, including: price of fruit and vegetables; a limited penetration in food services segments; aggressive promotion of Fast Moving Consumer Goods (FMCG), i.e. processed foods; use of a positive fruit and vegetable image by processed food sectors competing with fresh fruit and vegetables, e.g. sauces, drinks and jam; and food scares about pesticides (denigrating consumer protection campaigns, lack of consumer knowledge about maximum residue levels and other food safety indicators). These perceptual barriers need to be overcome if fruit and vegetable consumption are to become more widespread.

4.1.4 Monitoring and evaluation

Monitoring and evaluation are essential to determining the success of an integrated strategy. Evaluations should be performed regularly. In Europe, monitoring and evaluation have been undertaken through a Health Impact Assessment (HIA), which is a policy tool that has been applied to the CAP within the EU to assess public health outcomes of agricultural policies. In 2003, Sweden published an HIA on agriculture policies that indicated that the CAP is becoming more health-oriented due largely to the BSE outbreak, which put a new impetus on food safety and public health. However, the report also states that, when it comes to the major health determinants like nutrition, EU agricultural and food policies continue to counteract public health ambitions. In particular, the report says that the CAP is biased in favour of producer interests and to the disadvantage of especially low-income consumers through high prices. The first attempt to apply an HIA at a country level was undertaken by the Republic of Slovenia as it prepared to join the European Union in 2002. A report published on this effort in 2003 revealed that assessing the health implications of agricultural policies requires effective cross-government cooperation at the national and regional levels. Monitoring and surveillance of efforts to combat obesity was also one of the commitments made by European stakeholders participating in the 2005 EU Platform on “Diet, Physical Activity and Health.”

4.1.5 Research and innovation

The research team found that integrated agrifood and health policies must be reinforced by research and knowledge transfer/exchange programs. An emphasis should also be placed on innovative product and technology developments. Research and innovation, however, were not widespread themes among the European examples reviewed. Under the EU Platform on “Diet, Physical Activity and Health,” product development and reformulation is one of the commitments participating stakeholders have agreed to, along with research projects. In Sweden, the program to reduce fossil fuel and energy use, and to meet health targets, calls for the use of increased technological sophistication to reduce the resources needed to produce goods.

In the US, the Robert Wood Johnson Foundation has established a national program, called Healthy Eating Research, which supports research on environmental and policy strategies to promote healthy eating among children and prevent childhood obesity. The project's objectives are to: establish a strong research base regarding policy and environmental factors that influence healthy eating and body weights in children; build a vibrant, multi-disciplinary field of research and a diverse network of researchers; and ensure that the research findings are effectively communicated to policymakers. The targeted outcome of the project will be to achieve an understanding of the larger environmental and policy issues that influence childhood eating and drinking behavior. The Robert Wood Johnson initiative integrates healthy eating and active living strategies to address childhood obesity. Although the present study doesn't factor in physical exercise, the research makes it clear that energy balance, as influenced by both food intake and physical activity, is critical to an integrated policy and strategy. Therefore, a truly comprehensive and integrated food policy for Canada should incorporate energy balance targets.

4.2 Initiatives in Canada

In Canada, many federal government policies impact food. However, Canada lacks an integrated agrifood and health policy. To date, many of the federal food, agriculture, and health policies in Canada have emerged in isolation from one another, and have not spanned or reflected the broader responsibilities held by various ministries. AAFC has recognized the need to look beyond the farm in terms of shaping future policy, and to acknowledge the growing consumer demand for safe and nutritious food. The department has acknowledged that in Canada "an integrated Food Policy is urgently needed"[37]. AAFC also recommends the creation of a healthy food policy, one uncoupled from traditional agricultural policies.

Since it has no integrated policy, the federal government cannot be analyzed in terms of how it has addressed the components of an integrated strategy. A recent study[38], however, suggests that strategic collaboration is one of the country's most pressing needs. The study, a review of food and health policies in Canada entitled "Integrating Food Policy with Growing Health and Wellness Concerns," notes that agricultural programs and a wide variety of non-food-related policies that could affect dietary choice have been established "in complete isolation from health policy." The result has been a negative net effect on public health, underscoring the importance of inter-agency cooperation. The report goes on to state: "Greater cooperation between Health Canada and Agriculture and Agri-Food Canada is a necessary first step to resolving any tensions between healthy food choices and agricultural policy." Policies within various government bodies are actually at odds with one another. One government policy can create a policy failure related to another government policy. In this respect, both federal and provincial governments need to work to align all dimensions of policies that affect food, agriculture and the health of Canadians.

Some of Canada's provinces have made varying attempts to integrate agrifood and health, including Alberta, BC, Ontario, and Quebec. Quebec, in particular, has undertaken several recent food and health research projects, largely resulting in recommendations encouraging population

[37] AAFC 2007
[38] Cash (et. al) 2004

health policies and education and marketing. For example, a 2006 working group put forth six priorities pertaining to food and health for the province: to raise awareness, educate and inform the population about healthy eating habits; to mobilize producers, food processors and manufacturers, distributors, restaurants and retailers to produce, distribute and serve foods that address nutritional preoccupations and promote healthy eating habits; to facilitate exchanges between consumers, producers and food processors in order to promote the consumption of fresh products and to increase knowledge on existing local products, while increasing consumer awareness about healthy eating; to facilitate access to healthy eating for populations living in different geographical areas; and to use governing tools to manage diet-related health problems. The working group also recommended preventing diet-related diseases by ensuring the highest standards of food quality. Similarly, Quebec's public health program (2003-2012) proposes several public health objectives, including: raising to 80% the proportion of people consuming five or more servings of fruit and vegetables (by 2012), and reducing to less than 8% the number of people suffering from food insecurity. Specific interventions would include: developing nutrition education programs on fruit and vegetable consumption within the general population; reinforcing local and regional concerted actions on food security; and organizing activities related to healthy eating in primary and secondary schools.

All of Canada's farm commodity groups have developed self-funded associations or councils at the provincial and national levels to further their economic and business interests. These associations recognize the competitive advantage they can gain from participating in initiatives that combine food and health priorities. Some advocate strategic collaboration, while others are focused on research and innovation.

In terms of strategic collaboration, most of the commodity groups have established formal linkages with voluntary organizations in nutrition and health, such as the Heart and Stroke Foundation, the Canadian Cancer Society, and the Canadian Diabetes Association. For example, the Beef Information Center and the Canadian Pork Council, which represent the beef and pork industry to the consumers, are active participants in the Heart and Stroke Foundation's Health Check™ program. The Health Check™ program is designed to help consumers quickly make healthy food choices. The program is based on Canada's Food Guide to Healthy Eating. Use of the Health Check™ symbol requires that the food product meet strict standards (e.g., maximum fat content in the case of meat products). The inclusion of meat products in the Health Check™ programs reflects the efforts of the livestock industry to reduce the fat content of beef and pork. The commodity groups also have healthy working relationships with the Canadian Food Inspection Agency (CFIA), in terms of such issues as grading, plant inspections, on-farm food safety, and animal care. For example, Canadian consumer confidence in the safety of Canadian beef remained high in the wake of the BSE issue thanks to the cooperative management of the issue by the CFIA and the Canadian Cattlemen's Association. In fact, beef consumption by Canadians increased during the 'crisis' period.

In terms of research and innovation, many farm commodity groups in Canada are working toward introducing new products and expanding their market opportunities. The Flax Council of Canada, for example, promotes the health benefits of flax. Research sponsored by the Council supports the claim that the beneficial properties of flax include: a lower risk for heart disease, prevention of some forms of cancer, treatment of immune disorders, treatment and prevention of

diabetes and relief from constipation. Flax is a rich source of lignans, which are anti-cancer agents, and soluble fiber, which alleviates and prevents diabetes and constipation. The high level of linolenic acid (an omega-3 fatty acid) in flax has been shown to correct the imbalance created by the relatively high level of linoleic acid (an omega-6 fatty acid) in the modern diet and thus is believed to decrease the risks of cardiovascular disease and immune disorders.

For their part, supply management commodity groups (dairy, egg, chicken and turkey) underwrite research in various areas of nutrition and health. They are all interested in encouraging research that will help bring value-added products to the market and make their sector more competitive. The Dairy Farmers of Canada' research investment ($1M annually) emphasizes bone health, gastrointestinal health, cardiovascular health, cancer prevention and obesity management. The Canadian Egg Marketing Agency has posted research results on its website showing how egg consumption can play a role in preventing breast cancer, maintaining health in old age, maintaining weight control, and balancing cholesterol levels.

Similarly, Pulse Canada is developing a strategy focused on new market opportunities in North America. Pulse Canada is the national industry association representing the provincial pulse grower groups from Alberta, Saskatchewan, Manitoba, Ontario and the pulse trade from across Canada. The objective of the Pulse Innovation Project is to increase pulse utilization in North America through innovative product developments that add value to Canada's pulse crops by moving them up the value chain. The project is largely targeting the food industry by fostering the expansion of new market opportunities for whole pulses and pulse components. These initiatives include the funding of human clinical trials to demonstrate the health benefits of pulse consumption. The studies are focused on the effects of regular pulse consumption on health outcomes related to obesity and chronic diseases such as diabetes and heart disease. These studies are being conducted by collaborators at the University of Manitoba (Richardson Centre for Functional Foods and Nutraceuticals and the Canadian Centre for Agrifood Research in Health and Medicine), the University of Guelph and the AAFC Food Research and Development Centre in St. Hyacinthe, Quebec. Critical reviews of research in the areas of diabetes, cardiovascular disease and cancer were initiated early in 2006. These reviews evaluated the quality of existing nutrition and health research according to Health Canada and FDA standards of evidence, established research gaps for the pulse industry, and identified areas where the evidence is strong enough for the pulse industry to pursue a health claim.

The Canola Council of Canada is also involved in research and innovation. Most of the growth in canola output in Canada over the last few decades is due to its desirable properties as a vegetable oil for healthy human diets. Canadian canola has many competitors in the world's growing vegetable oil market (soy, palm, sunflower, corn and canola from other countries). Current health/nutrition issues like obesity, chronic heart disease and trans-fat create market opportunities for canola and other vegetable oils. The canola industry is responding to this opportunity at all levels in the value chain, including: research and development (public and private), farmers, industry organizations, processors, regulators (pesticide registration, variety registration, and IP management), nutritionists/dieticians, health professionals and health and safety conscious consumers.

5 Broader issues impacting an integrated agrifood and health policy for Canada: Challenges and Opportunities

5.1 Regulatory philosophy and framework

Safe food and good nutrition are important to Canadians. Maintaining the safety of Canada's food supply is a shared responsibility among government, industry and consumers. However, much debate has occurred on implementation issues. Should we use voluntary or compulsory methods? Who should pay? These questions often reflect ideological viewpoints.

Cash[39] has document ways the government can participate in regulating the food and health interface, and why government involvement is important. Some considerations include:

- Government intervention into the public realm is justified in the presence of market failures. In terms of food policy and health, the single most important failure is probably the lack of full information, especially on the part of consumers. When a lack of complete information is a large failure in the marketplace, a government can either step in directly to provide information or can impose regulations to compel manufacturers to educate consumers.

- The high societal costs of diseases related to food consumption are another important failure that would not be properly accounted for in the absence of interventions. In addition, there are other "special" roles assumed by government that are relevant here. The protection of children and a general interest in individual health beyond the costs imposed on society are all part of the debate regarding appropriate food and health policies.

- A related issue is the regulation of producers' and manufacturers' health claims. On the one hand, allowing producers to advertise the beneficial effects of their products can help bring about a healthier population. On the other hand, too many health claims can lead to consumers being swamped with questionable information. The challenge for government is twofold. First, it must not allow health claims to be used as a marketing tool if the net effect is to decrease the public health. Second, it must proceed in ways that do not lessen the effectiveness of its own health promotion messages. The government must also consider the issue of validating the health claims.

- There is considerable debate regarding the regulations surrounding functional foods and nutraceuticals, which are both regulated by Health Canada.

- There is a perception that foods produced in Canada are subjected to more stringent food safety standards than are imported foods.

In considering ways of integrating agrifood and health, it is important to consider the responsibilities of Health Canada[40]:

[39] Cash, et al, 2004, pp 119 - 121

- Establishing policies, setting standards and providing advice and information on the safety and nutritional value of food;
- Promoting the nutritional health and wellbeing of Canadians by collaboratively defining, promoting and implementing evidence-based nutrition policies and standards;
- Administering the provisions of the *Food and Drugs Act* that relate to public health, safety and nutrition;
- Evaluating the safety, quality and effectiveness of veterinary drugs.

Another key player is the Canadian Food Inspection Agency (CFIA), which was established in 1997. The CFIA brought together inspection and related services previously provided through the activities of four federal government departments: AAFC, Fisheries and Oceans Canada, Health Canada and Industry Canada[41]. The agency consolidated the delivery of all federal food, animal and plant health inspection programs. The CFIA enforces the food safety and nutritional quality standards established by Health Canada and sets standards for animal health and plant protection, while carrying out enforcement and inspection. The CFIA reports to Parliament through the Minister of Agriculture and Agrifood Canada.

In Canada, regulating nutraceuticals and functional foods is a challenge. A regulatory review process was established several years ago (Smart Regulation) to recommend improvements in Canada's regulatory system. The improved system was meant to facilitate innovation and investment in the agrifood sector. Coordination among departments is a key issue. Few regulatory issues fall under the exclusive mandate of a single federal department. In the food processing sector, for example, four different agencies/departments (Health Canada, CFIA, Environment Canada and AAFC) may all be involved in reviewing an application. Many applicants have expressed frustration with the process. The consequences include: inefficiency in the regulatory system, increased costs for applicants, and a disincentive for investment in Canada.

An alternative model exists in Australia and New Zealand,[42] which established an independent statutory agency called Food Standards Australia New Zealand (FSANZ). FSANZ develops food standards and joint codes of practice with industry, covering the content and labeling of food sold in Australia and New Zealand. In addition, FSANZ develops Australia-only food standards that address food safety issues – including requirements for primary production – and maximum limits for agricultural and veterinary drug residues. In its 2006-2009 corporate plan, FSANZ describes its vision as: "a safe and diverse food supply for Australia and New Zealand" and its mission as: "to develop effective food standards in collaboration with Australian and New Zealand governments." FSANZ aims to develop food standards that provide the minimum regulatory burden necessary to maintain a safe food supply and informed consumers. FSANZ aims for transparency and wide consultations. To achieve these goals, it maintains collaborative arrangements with its regulatory partners and with primary producers and processors, manufacturers, retailers, consumer organizations, public health bodies and other stakeholder groups. The project team concluded that the FSANZ model may have applicability in Canada.

[40] Health Canada website
[41] CFIA website
[42] Heasman 2007

5.2 Functional foods and nutraceuticals[43]

In Canada, consumers increasingly believe in the potential health benefits of functional foods and nutraceuticals. A recent Health Canada Survey (Health Canada, 2005) reported that approximately 71% of Canadians are supplement users, and 77% think that natural health products could be useful to maintain or support health. Some evidence exists suggesting that functional foods – alongside broader changes in diet – could help reduce the incidence of certain diet-related diseases.

Currently, no coherent policy on functional foods and nutraceuticals exists in Canada. The availability and affordability of these products, not to mention their effectiveness and safety, need to be addressed in public policies. Such policies should revolve around the contribution of these products to healthy eating and public health, vis-à-vis enhancing the wellbeing of Canadians and reducing public health care costs. Industry is already engaged in the innovation and commercialization of these products, even within the constraints of the current regulatory regime for novel products and claims. These products may contribute to reducing the incidences of diet-related disease, especially in high-risk groups. To date, the federal government has defined a regulatory platform for these products, but has not considered ways to integrate them into health promotion and agrifood policies.

These products could present valuable opportunities for the Canadian agrifood sector. Numerous agricultural products in Canada are potential sources of functional ingredients, such as soy, tomatoes, pulses, and flax. The demand for dairy and cereal food products, for example, could be enhanced if they incorporated functional ingredients. The market for these products is likely to expand, domestically and internationally. Recently, one of North America's biggest suppliers of flax for human and animal consumption, Manitoba-based Pizzey's Milling, was bought by Glanbia Ptc., an Irish dairy and food ingredient supplier. This acquisition reflects the growing interest in flax by major food companies, such as General Mills, Quaker and Kellogg's, and the perceived need for Glanbia's Pizzey's Milling to grow quickly in order to handle the expected growth in the market for flax for edible use.[44] Canada has an opportunity to establish and maintain a competitive position in this burgeoning industry. The development of public policies – both in terms of a regulatory regime and broader issues (research, innovation, and intellectual property) – will play a central role in this progress.

In Canada, Health Canada regulates the functional food and nutraceutical industry and the CFIA enforces these regulations. Within Health Canada's Health Products and Food Branch, the Food Directorate regulates functional foods, while the Natural Health Products Directorate regulates nutraceuticals and other natural health products.[45] Regulatory regimes generally aim to establish a reasonable scientific consensus on a product's safety and efficacy. However, the standards of evidence, and therefore the stringency of approvals for novel product ingredients and processes,

[43] See Yada, et al, for a more detailed discussion on regulatory issues in functional foods and nutraceuticals in Canada and other jurisdictions.
[44] Winnipeg Free Press, September 18, 2007
[45] http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1171035633928

will vary between countries. The US and Japan are on the lenient end, and Canada and the EU are on the more stringent end. Arguably, a conservative approach affords a greater level of protection to consumers. Conversely, restricting or delaying the marketing of such products could delay their contribution to improved health and wellbeing in the citizenry. Similarly, regulating the extent to which companies can make claims about a product is a balancing act between consumer protection from false information and allowing the free communication of the product's potential benefits.

Much debate has occurred on how well functional foods and nutraceuticals actually promote public health, and therefore the extent to which they could be considered as part of an integrated agrifood and public health policy. One concern is whether people will focus too much on specific products, rather than taking a total diet approach to enhanced nutrition. Another issue concerns the efficacy of approving functional ingredients on the basis of clinical trials prior to establishing wider public health impacts. Even if such efficacy can be established, critical issues remain: how to facilitate access to functional foods and nutraceuticals, especially in disadvantaged groups; and how to communicate the specific benefits of such products to particular 'at risk' groups.

5.3 Nutrigenomics[46]

Over the past century, scientific advances have led to the eradication of many nutritional diseases, including rickets, pellagra, and scurvy. However, solutions to the nutrition-related chronic diseases that burden modern society remain elusive. Obesity, diabetes and cardiovascular disease are reaching epidemic proportions. The social and economic costs of these diseases are staggering. Type 2 diabetes alone is estimated to cost our healthcare system over $13 billion per year and affects nearly 1.5 million Canadians. Although dietary and genetic factors have been implicated in the development of the major chronic diseases, the precise causes cannot be uncovered by focusing on either nutrition or genetics alone.

Nutrigenomics is an emerging field of research that offers innovative approaches for addressing the etiology of complex chronic diseases. It involves investigating how genes and nutrition interact to affect human health. Nutrition research has long faced a few key challenges:

- the difficulty of accurately assessing nutrient intakes in populations over time;
- the variability in individual responses to various nutrients;
- the years or decades it takes for the major chronic diseases to develop.

Biomarkers need to be developed that accurately reflect nutrient intake, and biomarkers are needed that can reliably represent early stages of disease development. Previous efforts to identify nutritional biomarkers have been hampered by the lack of specificity to particular nutrients, the poor sensitivity to changes in intake, and the large inter-individual variability in responses.

Genomic science now provides the necessary tools to develop sensitive and reliable biomarkers that can be used to unravel the links between specific nutrients and various health outcomes. This

[46] See Ahmed El-Sohemy 2007 for more details

fundamental knowledge is required for identifying nutritional factors that affect our health, for developing personalized nutrition advice, and for making evidence-based public health recommendations for the prevention of the major chronic illnesses of our time. This science can also be used by Canada's agrifood industry to become a global leader in developing functional foods with validated health claims. A unique opportunity exists for Canada to bridge its current strengths in nutrition and genomic sciences with state-of-the-art core facilities that exist in both fields across the country. Canada could create a world-class biomarkers' initiative using nutrigenomics, and employ this knowledge for improved human health.

In addition to the gaps, issues and opportunities identified above in functional foods, nutraceuticals and nutrigenomics, numerous additional issues exist that must be accounted for in developing and adopting these products and technologies:

i. The issue of functional foods and nutraceuticals and their positioning in relation to drugs is still relatively unclear in the minds of the public and regulators alike;
ii. Traceability and authentication of ingredients in functional foods and nutraceuticals will be critical to policy/regulations;
iii. Issues of messaging in relation to recommended amounts of functional foods and nutraceuticals to be consumed need to be examined;
iv. In the area of nutrigenomics, various social/ethical issues may arise. For example, how results may impact on the availability of "life insurance" and potential litigation if nutritional advice fails to prevent a particular chronic disease will have to be examined.

5.4 Canadian food and health research organizations

In Canada, a number of research institutes, centres and/or networks are addressing the issue of the intersection of food and health primarily from a research perspective. Some are also addressing policy issues. The engagement and collaboration of these organizations will be critical to determining the inter-relatedness between agrifood and health, and in establishing a policy framework and constituent policies.

5.5 Short food supply chains[47]

Over the past 10 years, North America and Europe have experienced a surge in interest in local food economies (LFEs), popularizing the concept of Short Food Supply Chains (SFSCs). Alternative food networks (AFNs), and SFSCs, embody alternatives to the more standardized industrial mode of agricultural and food supply. They represent modes of food provisioning that vary from the prevalent, supermarket mode of food marketing in countries like the UK, US, and Canada. AFNs and SFSCs attempt to establish closer – or more connected – relationships between food producers/production and consumers/consumption. Local food economies and SFSCs have three potential key benefits:

[47] See Heasman 2007 for more details.

- Environmental – sustainable production and reduced transport externalities ('food miles');
- Economic – through greater incomes for farmers and more financial contributions to local economies;
- Social benefits – to consumers and producer groups.

Economically, this alternative market is increasingly relevant. In Alberta, for example, the 2004 provincial market value of alternative agricultural markets was estimated to be $963.6 million. These markets included farmers' markets, regional cuisines, farm direct, on-farm activities, and off-farm activities. In Ontario, farmers' markets and direct farm marketing alone generated sales of $761 million in 2005. Consumer demand and some producer interests (usually smaller-scale operations) are driving this interest. Consumers perceive these products as being fresh, tasty, and healthier. Locally produced food has also become popular thanks to up-scale chefs and restaurants, while tourism interests have embraced culinary tourism. However, although agricultural ministries are becoming increasingly interested, local food economies barely register at the federal level in terms of agricultural policies. Food obtained from SFSCs may be considered healthier, but no scientific evidence has been found that supports this conclusion.

5.6 Access to Adequate, Safe and Nutritious Food

Achieving an adequate food supply means more than ensuring people aren't hungry. It embodies the concept of a safe and nutritious diet that is acceptable to each individual, provides optimal health, and is universally available[48,49]. This concept – often described as food security – has advanced appreciably, particularly in the past decade. In Canada, dietitians have recommended that food security be achieved "through a sustainable food system that maximizes healthy choices" and "community self-reliance"[50].

Poverty and social justice are at the heart of food security. The poor and socially disadvantaged are the most likely to be food insecure, and the most powerless to change their situation[51]. This state of affairs exists not only in developing countries, but also industrialized nations. In 2004, the Canadian Community Health Survey (CCHS) found that 8.8% of the population (2.7 million Canadians) had trouble accessing adequate food[52]. The problem was most prevalent for: households with the lowest income; those relying on social assistance or compensation or employment insurance as their main source of household income; and those led by a single parent (especially a lone female parent). The CCHS data revealed that vulnerability to adequate food varies. Therefore, so will the required actions to prevent food insecurity.

[48] FAO, 1996. Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.
[49] CAPI has put forward the concept that "Access/barriers to healthy eating concerns the living and working environment that affect people's health; the conditions that enable and support people in making healthy choices". See Appendix B. Relevant issues could include social and physical environments, income and social issues, employment and working conditions, education, gender and culture.
[50] Dietitians of Canada, 2007
[51] AAFC and International Development, 1998
[52] Health Canada, 2004

In Canada, no comprehensive policy framework currently exists to integrate a sustainable, safe and nutritious food supply. Canada's agricultural policies, for example, are primarily aimed at developing and expanding Canada's production and export of agricultural products, and positioning Canada as a world leader in food safety and environmentally sound agricultural production[53]. Notably, a significant number of Canadians have difficulty accessing adequate food despite the fact that the proportion of disposable income spent on food continues to decrease in Canada[54]. A growing consensus is building over the need to harmonize policies governing food production, food safety, the environment and health in Canada. Policies are also needed that will reduce poverty and socio-demographic barriers to getting adequate, safe and nutritious food to all Canadians.

6 Conclusions and Recommendations

6.1 Lessons learned and guiding principles for an integrated agrifood and health policy

The project team made several observations that could be categorized as "lessons learned" in the effort to develop an integrated agrifood and health policy for Canada. Some of these lessons are described below. Unfortunately, no "magic bullet" exists that provides the single-source solution to improving Canadians' health benefits while contributing to the economic wellbeing of the agrifood sector.

- Components of an integrated agrifood and health policy should include: strategic collaboration, a regulatory and economic framework, a population health strategy that includes an education component, monitoring and evaluation, and research and innovation.

- Many of the initiatives reviewed for this project are quite recent and have not yet been fully evaluated for their impacts on food consumption patterns, health outcomes, or agriculture (particular on farmers). Monitoring and data collection need to be included when a new policy is initiated to assess impacts. This built-in evaluation component is necessary in order to develop a useful, evidence-based approach.

- The vast majority of policy initiatives to date have been too fragmentary to guarantee success. The relevant linkages between food and health lie well beyond the purview of any one agency.

- Agriculture is essentially a market-driven activity, while health is a social good that rarely has to pass the economic viability test. Thus an integrated agrifood and health policy is a challenge. A transparent dialogue between the agriculture and health sectors is needed. In Canada, as in Europe, most integrated food and health strategies to date have

[53] AAFC, 2005
[54] Statistics Canada, 2003

operated in isolation from the agriculture sector. To prove successful, integrated policies must be developed through a process that includes producers in the food chain.

- In Canada, the development of both agricultural and health policies has been complicated by shared jurisdictions between the federal and provincial governments. Superimposing an integrated approach on this structure creates additional challenges. A fully integrated approach requires strategic collaboration across government jurisdictions, ideally including the participation of local, community-based institutions, non-government and industry groups, health professionals and agricultural producers.

- The integration of agrifood and health policies must be put into a historical perspective/context. Canada has a deep history of traditional export agriculture that responds mostly to market forces. Domestically, integrating agriculture with food and health concerns is a relatively recent concept that will require considerable education and adaptation on the part of all parties: the agricultural community, health organizations, governments, industry, and citizens.

- The development and implementation of an integrated agrifood policy is further complicated by the globalization of the food supply, international trade agreements and regulations, and increased collaborations aimed at achieving noticeably improved population health.

- Linking agriculture to health requires a more educated consumer who takes more responsibility for his/her choices. The marketing and distribution of processed foods is dominant and pervasive in advanced societies. Due to the complexity of the modern food supply and the relationship of diet to health, government departments and non-governmental organizations need to provide greater support to consumers who are trying to achieve an optimal diet. Citizens who desire a healthier lifestyle also need to invest time in seeking out healthy foods and educating themselves on where those foods originate. Understandably, economic and social considerations may limit the ability of certain groups in society to access a safe and nutritious food supply.

- An integrated policy needs systems/multidisciplinary thinking. A systems-thinking approach requires collaboration among diverse stakeholders, linking health and agricultural priorities. It requires formulating policy options at multiple levels and through multiple channels. A multidisciplinary approach involves drawing expertise from multiple disciplines to define and apply new ways of understanding the inter-relationship of agriculture, food and health.

- Policy-makers must have realistic expectations. No magic bullet exists in the pursuit of an effective policy that integrates agrifood and health. Often, genuine results can take a decade or longer. Successful strategies usually require a combination of multiple components, such as multi-level and cross-sectoral strategic collaboration along with a regulatory and economic framework. Population health policies – particularly those that introduce healthy eating projects in schools and other community-level institutions –

often work hand-in-hand with education and marketing initiatives, and are best implemented through the strategic collaboration of numerous agencies.

6.2 Some Promising Approaches

This project revealed some promising approaches – in Canada and abroad – to integrating agrifood and health policies, with varying implications for agriculture. The key points of these approaches, introduced earlier in this report, are summarized below.

Canada

In the 1980s, producers, food manufacturers, the government and health associations in Canada undertook numerous activities to reduce total and saturated fats in the food supply. These initiatives were stimulated, in part, by a major cholesterol conference in 1988. Food manufacturers responded to the plea for the production of foods that would help lower Canadians' blood cholesterol; they substituted hydrogenated vegetable oils for saturated fats and developed low-fat and fat-free foods. The federal government (AAFC) brought in beef and hog grading standards to reduce the fat and increase the lean content of carcasses. The government also supported the development of canola, a healthy vegetable oil that became a major export crop. The federal government (Health Canada) introduced regulations for nutrition labeling and nutrition claims and comprehensive dietary guidelines that recommended low fat food choices. In recent years, fat consumption has decreased slightly but specific decreases in fat intake are often compromised by other changes in food habits. For example, cream consumption increased as a result of people drinking more coffee.

Denmark

In the mid-1990s, Danish margarine manufacturers agreed to voluntarily reduce the industrially-produced trans fat content of their products. A 2001 review indicated that this commitment had little effect on the country's overall trans fat intake. In 2004, the Danish government passed legislation that prohibited the use of industrially produced fats and oils containing more than 2% of trans fat. Two years later, foods that traditionally were significant sources of trans fat were virtually trans free. However, international food companies that had reduced the trans fat content of foods for sale in Denmark continued to sell the same foods outside the country with the traditional trans fat content.

Finland

Over two decades (1970s-1990s), health agencies in Finland worked with the food industry to alter the food supply. During this time, vegetable and fish consumption rose substantially, while the consumption of saturated fat declined. Mortalities from coronary heart disease plummeted. Dietary guidelines were developed for schools, which became a template for the development of guidelines for other groups (e.g., day cares, elderly homes, armed forces). The strategy was a systematic, planned approach with a clear overall vision.

Norway

In 1975, Norway launched a Nutrition and Food Policy to combat cardiovascular disease by reducing fat in the diet. The goal was to reduce the proportion of fat in the diet from 40% to 35% of the energy supply. The agriculture sector saw the value of adapting to the emerging diet-health paradigm, and helped introduce an effective national food policy that linked policies of agriculture, food processing, consumers, health and rural affairs.

US

In 1972, the US introduced a program to improve the health of low-income women, infants and children (WIC). Participants in the program were provided with vouchers to use at authorized food stores. As well, the women can use the vouchers to purchase unprepared, locally grown fruits, vegetables and herbs. Studies have shown that participants have longer gestation periods, higher birth weights and lower infant mortality than non-participants. They also had lower Medicaid costs than non-participants (an average of nearly one night shorter hospital stay per infants and one-quarter night for mothers, and 14% fewer infants who ended up in ICU).

6.3 Recommendations and Next Steps

A number of recommendations flow out of this analysis:

1. The federal government, working with stakeholders, should develop a vision for an integrated agrifood and health policy in Canada. The federal departments involved should include Agriculture and Agri-Food Canada, Health Canada, Environment Canada, and the Department of Finance.

2. This initiative should have an appropriate "political champion," perhaps out of the Prime Minister's Office. This level of involvement appears to be required to integrate concepts of sustainability into a food and health policy.

3. The Canadian Agri-Food Policy Institute (CAPI) should facilitate the development of this vision, which should include the participation of provincial governments, industry groups, and health related organizations and professionals.

4. The governments and stakeholders involved in developing the vision should define the role of governments, industry and society (from an information, regulatory, and incentive-based perspective) in an integrated agrifood and health policy.

5. The participating governments and stakeholders should make monitoring and data collection central to any agrifood and health policy that emerges from the development of an integrated strategy. This built-in evaluation component is necessary in order to develop a useful, evidence-based approach, as opposed to piece-meal and "after the fact" analyses.

6. Initiatives that purport to have beneficial health impacts, whether they be technological in nature (e.g., functional foods or nutrigenomics), or social in nature (e.g., short food supply chains), should be validated and evidence-based.

7. The participating agencies should develop and appropriately fund a research strategy and structure to support an integrated agrifood and health policy.

8. The participating agencies should put more focus on the interface of food and health for women, infants and children.

In the course of this review – and as a result of comments from referees – many other relevant issues emerged. But scope and time constraints kept the project team from exploring them in detail. The project team recommends that future work be undertaken on the following topics:

- Initiatives relating to the integration of agrifood and health policies and programs at the provincial level;

- The effect of agriculturally related environmental issues on health (e.g., water quality and disease transmission from animals to humans);

- The changing structure of the agrifood industry, including increased concentrations due to globalization, and the impact of these changes on health. Observers have noted that business decisions by multinational companies are not necessarily accountable to national government goals and objectives;

- Obesity as a behavioral issue, not just a health issue. Observers have argued that personal change is an essential first step to make health and nutrition initiatives successful;

- Methodology for measuring the benefits of improved nutrition;

- The applicability to Canada of an independent statutory agency similar to Food Standards Australia New Zealand (FSANZ);

- The concept of the “Canadian Climate Change Advantage Diet.”

REFERENCES

AAFC and International Development. Canada's Action Plan for Food Security, 1998

AAFC. Agricultural Policy Framework: Federal-Provincial-Territorial Programs, 2005

Agriculture and Agri-Food Canada. 2007

Besharov DJ and Bermanis D. Rethinking WIC: *An evaluation of Women, Infants and Children Program*. Washington, DC. AEI Press 2001

Best, A. *System Thinking: A Conceptual Framework For Integrated Food And Health Policy,* 2007

Bitler MP and Currie J. Does WIC work? The effects of WIC on pregnancy and birth outcome. J of Policy Analysis and Management 2005; 11:593-92.

Canadian Agrifood Policy Institute (CAPI). *Moving Forward on Vision and Action for Canadian Agriculture,* February 2007.

Canadian Food Inspection Agency. Government of Canada. http://www.inspection.gc.ca/

Carlsson-Kanyama, A. *Climate Change and Dietary Choice: how can emissions of greenhouse gases from food consumption be reduced?* Food Policy, 23, 3, June. 1998.

Cash, Sean B. et al. *Integrating Food Policy with Health and Wellness Concerns: An Analytical Literature Review of the Issues Affecting Government, Industry and Civil Society,* Report prepared for AAFC Food Value Chain Bureau, 2004 (pp 119 – 121).

Commission on Environmental Health. *Environment for Sustainable Health Development – an Action Plan for Sweden*. Stockholm: Ministry of Health and Social Affairs. Swedish Official Reports Series. 1996 (p. 124).

Curtis, L.J. and W.J. McMinn. *Health Care Utilization in Canada: 25 Years of Evidence,* SEDAP Research Paper 190, May 2007

Devaney B, Bilheimer L and Schore J. *Medicaid costs and birth outcomes: The effects of prenatal WIC participation and the use of prenatal care.* J of Policy Analysis and Management 1992; 11:593-92.

Dietitians of Canada. Community Food Security: Position of Dietitians of Canada, 2007

Dubois, L. *Food Safety Issues,* Technical Report, 2007.

El-Sohemy, Ahmed. Nutrigenomics: Reducing Chronic Diseases in Canada by Linking Genomics with Nutrition, Technical Report, 2007.

EU. Proposal for a Decision of the European Parliament and of the Council Adopting a Programme of Community Action in the Field of Public Health (2001-2006). Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. Brussels, COM. 2000. (285 final, May 16).

EU. Green Paper on *Promoting healthy diets and physical activity: a European dimension for the prevention of overweight, obesity and chronic diseases* (December) 2005.

EU. White Paper from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on: A Strategy for Europe on Nutrition, Overweight and Obesity related health issues (May). 2007

FAO, 1996.

Health Canada. Government of Canada. http://www.hc-sc.gc.ca/index_e.html

Health Canada. *Canadian Community Health Survey Cycle 2.2, Income-Related Household Food Security Canada*. 2004

Heart and Stroke Foundation of Canada. Incidence of Cardiovascular Disease. http://www.heartandstroke.ca/Page.asp?PageID=110&ArticleID=1077&Src=news

Heart and Stroke Foundation of Canada. The Changing Face of Heart Disease and Stroke in Canada 2000 http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=reports_heartdisease_e [ISBN 1-896242-28-6]

Heasman, M. *Short Food Supply Chains*, Technical Report, 2007.

Helsing, E. *Trends in fat consumption in Europe and their influence on the Mediterranean diet*. European Journal of Clinical Nutrition, 47, Suppl. 1, S4-S12. 1993.

Helsing, E. *Norwegian Nutrition Policy in 1987: what works and why?* Report from a research seminar, Vettre, Norway April 27-28. Copenhagen: WHO Regional Office for Europe. 1987.

Henson, S., et al. *Review of Integrated Food Policy*. Technical Report, 2007.

Lalonde, Marc. *A New Perspective on the Health of Canadians*. 1974

McAmmond D, et al (2000). Food and nutrition surveillance in Canada: An environmental scan. Prepared under contract for Health Canada.

McDonald, B., and L. Dubois and B. Sonntag. *Evolution of Dietary Fat Policies and Programs in Canada: Agri-food and health Policies – 1985 – present.* Technical Report, 2007.

Meyer-Ploeger, A. Grundsatzpapier Ernaehrungspolitik (*White Paper Nutrition Policy*). Published by: Wissenschaftlicher Beirat für Verbraucher- und Ernährungspolititk beim BMVEL (*Scientific Committee on Consumer and Nutrition Policy of the German Federal Ministry of Nutrition, Agriculture and Consumer Protection*). 2005.

National Nutrition Council. *The Norwegian Diet and Nutrition and Food Policy*. Oslo: National Nutrition Council. 1994.

National Nutrition Council. *Nutrition Policy in Finland*. Country paper prepared for the FAO/WHO International Conference on Nutrition. Rome. 1992.

Norum, K. *Some Aspects of Norwegian nutrition and food policy* in Shetty, P. and K. McPherson, Eds *Diet, Nutrition and Chronic Disease: Lessons from contrasting worlds*. Chichester: J. Wiley and Sons (p. 198).

Organisation for Economic Co-operation and Development (OECD). *Food Policy,* Paris, 1981.

Pietinen, P. *Trends in Nutrition and its consequences in Europe: The Finnish Experience,* in Pietinen, P. and C. Nishida and N. Khaltaev eds Nutrition and Quality of Life: Health Issues for the 21st century. Geneva: World Health Organisation (p. 67-71). 1996.

RNMA. *On Norwegian nutrition and food policy*, Report no. 32 to the Storting. Oslo: Royal Norwegian Ministry of Agriculture. 1975.
Statistics Canada. *Food Expenditure Survey,* 2003

Swedish Environmental Protection Agency. *A Sustainable Food Supply Chain: a Swedish Case study*. Stockholm: SEPA. Report 4966. 1999.

The Scottish Executive. *Hungry for Success: A Whole School Approach to School Meals in Scotland*. Edinburgh: the Stationary Office. 2003.

Tyrchniewicz, E.W. Assessing Progress: APF Review Panel Policy Report - Overview and Conclusions and Recommendations, May 2006.

Tyrchniewicz, E.W. and Allen Tyrchniewicz. *Vision and Strategic Direction Options for the Canadian Agricultural Sector,* Report prepared for CAPI, October 2005.

Vail, D. *Sweden's 1990 Food Policy Reform* in McMichael, P. ed. The Global Restructuring of Agro-Food Systems. Ithaca: Cornell University Press. 1994 (p. 66).

von Weizacher, E. and A.B. Lovins and L.H. Lovins. *Factor Four: doubling wealth, halving resource use*. London: Earthscan. 1997.

Yada, R. and D.Herath, S. Henson and J. Cranfield. *Functional foods and Nutraceuticals: Linking Agriculture to Public Health,* Technical Report, 2007.

APPENDIX A BACKGROUND OF PROJECT TEAM

PROJECT MANAGER

Ed Tyrchniewicz, Associate Dean and Professor, I.H. Asper School of Business, University of Manitoba

Dr. Tyrchniewicz completed his Ph.D. at Purdue University and joined the University of Manitoba in 1967 in the Department of Agricultural Economics. He was head of that Department from 1977 to 1984, when he became the Director of the Transport Institute. He held that position until 1988, at which time he became Dean of Agriculture and Forestry at the University of Alberta – a position he held until 1996. Other appointments and positions held by Dr. Tyrchniewicz include Senior Fellow at the International Institute for Sustainable Development (1996-99), founding Executive Director of the Manitoba Rural Adaptation Council (1997), Adjunct Professor (Agricultural Economics) at the University of Manitoba from 1998 to 2004 and Chair, Agricultural Policy Framework Review Panel (2005-06). He joined the Asper School of Business in 2003 where he is currently Associate Dean. He is also involved in public service advising and consulting in the areas of agricultural policy, natural resource management, and organizational management and capacity-building.

SENIOR HEALTH ADVISOR

Bruce McDonald, Professor Emeritus and Senior Scholar, Department of Human Nutritional Sciences, University of Manitoba

After completing his studies at the University of Alberta, Dr. McDonald obtained his Ph.D. in Nutrition and Biochemistry from the University of Wisconsin. His career has included the positions of Assistant Professor in the Department of Animal Science at McGill University, Associate Professor and Professor in the Department of Human Nutritional Sciences at the University of Manitoba, Dean of the Faculty of Human Ecology at the University of Manitoba and Executive Director of the Manitoba Health Research Council. Dr. McDonald's professional activities include participation on several health and nutrition boards and committees including the Research and Technical Committee for the Flax Council of Canada; the Functional Foods and Nutraceutical Advisory Board for Forbes Medi-Tech, Inc.; the Expert Committee on Fats, Oils and other Lipids for AAFC; the Research and Technical Committee for the Canola Council of Canada; and the Board of the National Institute of Nutrition.

INVESTIGATORS

Allan Best, Clinical Professor, University of British Columbia, Department of Health Care and Epidemiology and Institute of Health Promotion Research Senior Scientist, Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute

Dr. Best obtained his Ph.D. in clinical psychology from the University of Waterloo. His academic, research and consulting activities have earned him a reputation as a world leader in health promotion and organizational health. As Past President of the Canadian Association for Health Services and Policy Research, he also served as the founding Chair of the Department of Health Studies at the University of Waterloo, the world's first interdisciplinary department integrating the biological and behavioural sciences to study health promotion. Dr. Best was elected Fellow for outstanding research contribution by five professional associations and was awarded the 1996 O. Harold Warwick prize by the National Cancer Institute of Canada for outstanding contributions to cancer control.

Lise Dubois, Associate Professor and Canada Research Chair in Nutrition and Population Health, Department of Epidemiology and Community Medicine, University of Ottawa

A registered dietitian with a Ph.D. in health sociology, Dr. Dubois has extensive experience in the fields of nutrition, population health, social inequalities, child development, obesity and nutrition policy. She is currently the Canada Research Chair in Nutrition and Population Health. Dr. Dubois has served as principal investigator on numerous research projects and as an expert advisor to numerous boards and committees including the Canadian Heart and Stroke Foundation, and the Canadian Institutes of Health Research. Dr. Dubois has numerous scientific papers, monographs, books and book chapters to her credit.

Michael Heasman, Researcher and Writer, *Food for Good*, Honorary Visiting Fellow, Department of Health Management and Food Policy, City University, London, U.K.

Dr. Heasman is an interdisciplinary researcher, writer and communicator specializing in food and health, corporate social responsibility, and sustainability trends affecting food business in society. He completed his Ph.D. at the University of Bradford's Food Policy Research Unit. He has held a number of academic research positions including Research Assistant in both the Food Policy Research Unit at the University of Bradford and the Department of Economics at the School of Oriental and African Studies, University of London. He was Research Fellow in the Food and Economics Group at the University of Reading and Senior Research Fellow at the Centre for Food Policy at Thames Valley University. More recently, he was Assistant Research Professor, Food Policy, Department of Rural Economy, University of Alberta.

Spencer Henson, Professor, Department of Food, Agricultural and Resource Economics, University of Guelph

With an interest in the economics of food safety, quality and health, Dr. Henson obtained his Ph.D. in Food Economics from the University of Reading in the U.K. Currently a professor in the Department of Food, Agricultural and Resource Economics at the University of Guelph, Dr. Henson's research interests are focused in a number of different areas including consumer acceptability of functional foods, understanding and managing consumer concerns relating to new food technologies, and understanding the impact of regulations on advanced food innovation.

Bernard Sonntag, Professional Agrologist, Principal with Sonntag Agricultural Services

Raised on a mixed farm in northwest Saskatchewan, Dr. Sonntag has first-hand knowledge of agriculture and food production. In a public service career that spanned 37 years, Dr. Sonntag served in a variety of capacities including as an economist with Agriculture and Agri-Food Canada's (AAFC) Lethbridge Research Centre, Director of AAFC's Research Centres in Brandon, Swift Current and Lethbridge and Director-General of the Prairie Farm Rehabilitation Administration (PFRA). Dr. Sonntag has also participated in numerous studies, committees and research initiatives, including the Canadian Agri-Food Research Council's review of Canadian agricultural research priorities and the Sustainable Agriculture Working Group and the Agriculture and Rural Development Task Force under the China Council for International Cooperation on Environment and Development.

Rickey Yada, Professor, University of Guelph, Canada Research Chair, Food Protein Structure, **and** Scientific Director, Advanced Foods and Materials Network

Dr. Yada was awarded a doctorate from the Department of Food Science at the University of British Columbia in 1984. He has been a faculty member at Guelph since that time, where he has served as Chair of the Department of Food Science, and as the Assistant Vice President of Research, Agri-Food Programs. He is presently a Professor in the Department of Food Science and a Canada Research Chair in Food Protein Structure. He is also the Scientific Director of the Advanced Foods and Materials Network which is part of the Network of Centres of Excellence Program in Canada. His primary research areas are on structure-function relations of food-related proteins and carbohydrate metabolism as it relates to process quality. Dr. Yada has participated on numerous Natural Sciences and Engineering Research Council (NSERC) of Canada research awards panels and committees and also served on various panels for the Canada Foundation for Innovation. He was also a member of the Royal Society of Canada Expert Panel on the Future of Food Biotechnology.

TECHNICAL WRITER

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David is a consultant with West Hawk Associates, an award-winning communications firm that provides a full spectrum of communication services: writing, editing, design, project management, translation, and communication strategizing. West Hawk Associates produces a wide range of publications for government and corporate clients in Canada and abroad. Previously, David worked as a journalist for Canadian newspapers and magazines, including the Ottawa Citizen, Ottawa Sun, and Canadian Geographic. He also worked as an in-house corporate communications consultant. David holds a Bachelor of Journalism degree from Carleton University and a Master of Arts degree from Queen's University, and is a member of the Editors' Association of Canada.

APPENDIX B CAPI Agriculture and Health Matrix

The Framework

	Production	Processing	Distribution	Consumption
Health Protection				
Health Promotion				
Access/ Barriers to Healthy Eating				

4

For the purpose of this framework the following definitions will be used:

Agrifood (For purposes of this framework, "home grown" food is included along with conventionally produced and processed food, as well as organic food).

Production: the agronomic and biological activities involved in using resources such as land, water, fertilizers, feeds, chemicals, etc., that result in unprocessed farm commodities, e.g., wheat, cattle, vegetables, etc.

Processing: activities involved in "adding value" to raw farm commodities by transforming them into "food" for human consumption; this may be as simple as grading and washing potatoes, or more complex activities such as slaughtering cattle, cutting up carcasses, and packaging the beef under stringent health guidelines.

Distribution: activities involved in storing and transporting food in its final form from processors to retail outlets, institutions and restaurants.

Consumption: the preparation and eating of food at home, institutions and restaurants.

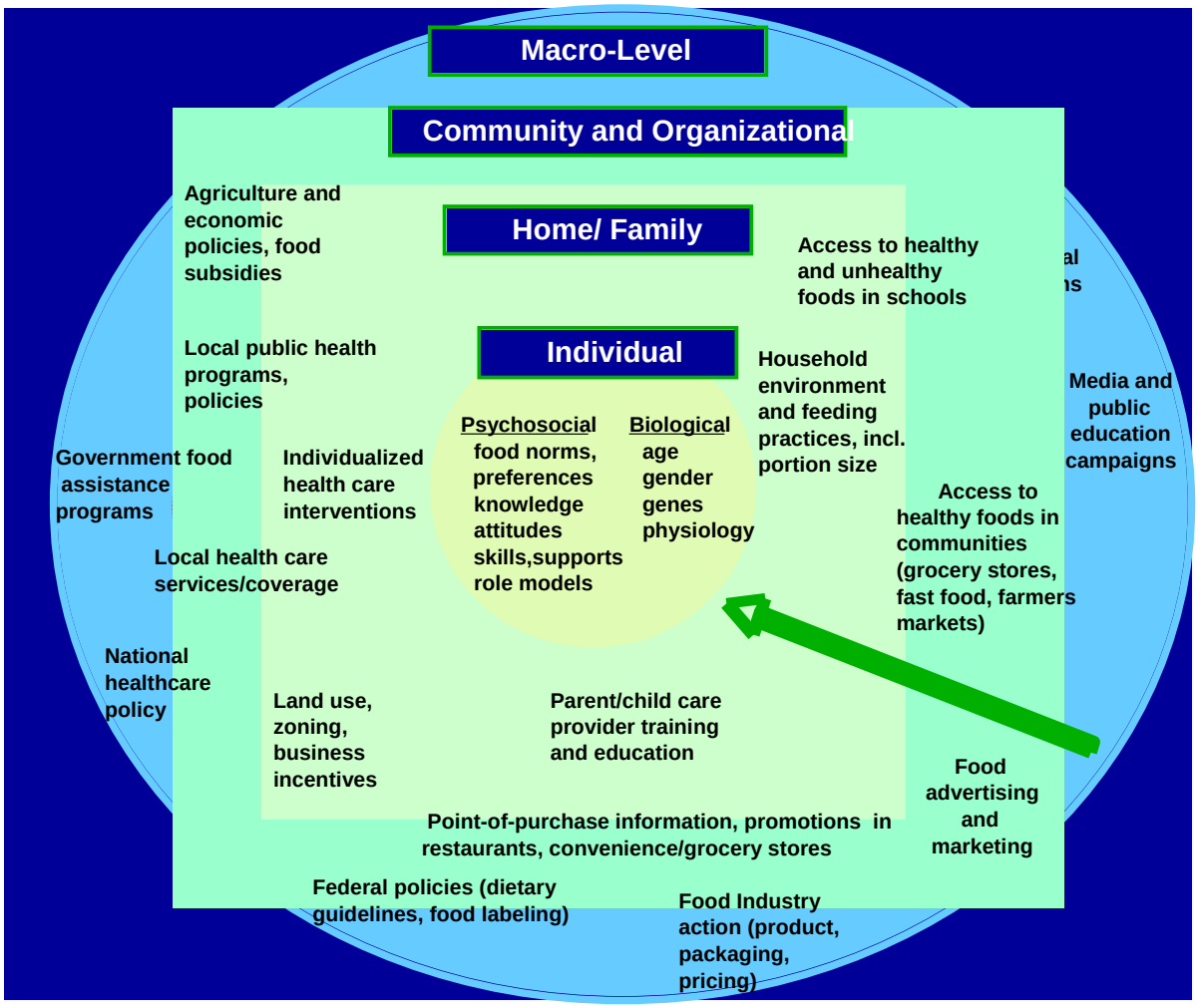
Health

Health Protection refers to those actions that help Canadian families and communities to live safer, healthier lives by making sure that the products Canadians use are safe.
(Disease prevention initiatives would also be included here).

Health Promotion refers to the process of enabling people to increase control over, and to improve, their health. (Public and private initiatives to promote healthy eating would be considered here)

Access/ Barriers to Healthy Eating concerns the living and working environments that affect people's health, the conditions that enable and support people in making healthy choices. Relevant issues could include social and physical environments, income and social status, employment and working conditions, education, gender and culture.
(Initiatives to support quality of life would also be included here)

APPENDIX C Robert Wood Johnson Foundation Social Ecology Framework for Food Strategy[55]



[55] Best 2007