

# Making the Food-Health Connection

*An Alberta Framework for Innovation*

July 2008



Alberta

It's time to ask: How can food and health address a growing number of public health concerns and chronic disease?

What changes must Alberta families make — along with governments, industry, and health care providers — to have a healthier future and, at the same time, offer economic development opportunities?

The Alberta food and health innovation framework brings us closer to this healthier future — improving health outcomes for our citizens as well as driving a stronger diversified Alberta economy based on “the healthy choice.”

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## Background

### Developing the framework

The Alberta food and health innovation framework was developed by the Alberta Life Sciences Institute in collaboration with Alberta Health and Wellness, Alberta Agriculture and Rural Development, Alberta Advanced Education and Technology, Alberta Science Research Authority (ASRA), and Alberta Agricultural Research Institute (AARI). The framework was developed as an overarching provincial approach to increase innovation in health and food, to meet challenges, and to take advantage of opportunities.

The framework development benefited from numerous conversations with Alberta's health, agriculture, and food innovation interests, as well as the ideas developed at the Alberta International Food and Health Think Tank, held in Banff in April 2007, [www.technology.gov.ab.ca](http://www.technology.gov.ab.ca), search on Think Tank Report.

In addition to providing a forum for gathering local and international input from industry and academia, the Think Tank confirmed and refined the groundwork for the current framework.

The next steps of the project is to develop a five year action plan that will identify the activities, budget, resource requirements and project milestones needed to implement the strategies identified in the framework.

The Alberta food and health innovation framework was developed under the leadership of the following individuals:

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# Executive Summary: Making the Food-Health Connection

## Alberta's Food and Health Innovation Framework

### Vision

- Albertans benefit from producing and eating food that makes them healthier.
- Alberta businesses participate in the global market place for healthy food products.

### Key Outcomes

- Government policy facilitates the development of new healthy foods and promotes healthy lifestyle choices, including the consumption of healthier foods.
- An efficient lab-to-industry innovation pipeline that results in development of new, Alberta-based healthy food products.
- Healthy food choices are affordable and readily available for purchase and consumption.
- Alberta's business environment stimulates the creation of many new commercially competitive healthy food and food products.
- Alberta's population is well-educated in nutrition and health outcomes.

### Required Elements

- People — both in management and science
- Infrastructure — food/health efficacy testing and scale-up facilities
- Programs — industry, science, and government partnerships





## Policy alignment and leadership

### Actions—New Products:

- Respond to consumer demands by developing new products and reformulating existing products, emphasizing the use of locally produced whole foods, ingredients, bioactives, and processed foods.
- Facilitate knowledge-brokering system and partnerships among industry, academia, and government to quickly translate the science into new innovative solutions.
- Advance expansion and availability of fresh locally produced foods.

### Actions—New Technologies:

- Explore new technologies and gain a better understanding of the related basic science.
- Invest in new technologies such as metabolomics, genomics and nanotechnology to provide businesses a competitive advantage, and provide consumers with an increased understanding on food-health relationships.
- Increase fundamental understanding of food's impact on health and knowledge translation to assist in product development and consumer and industry education.

### Actions—New Practices:

- Increase Albertan's knowledge about healthy food and lifestyle choices through education and marketing strategies.
- Encourage employers to support staff in making healthy food choices.
- Develop healthier food environments in public facilities, including schools, recreational centres and government buildings.
- Explore policy innovations to expedite change at a societal level.

## 1.0 Introduction

### Food and Health — has the average Albertan family made the connection?

Nutritionists tell us that diets should be moderate in terms of calories, and diverse in terms of the types of foods we eat. We should go easy on salt, sugar, and fats. We should enjoy fresh fruits, vegetables, grains, and meats as part of a balanced diet.

Despite this, we know that the average Albertan family chooses a diet that is far less balanced and less healthy than is good for them. What is more — they often eat portions that are much larger than their nutritional needs. Over time, these dietary choices can contribute to the development of type 2 diabetes, heart disease, and a range of other chronic and costly health conditions.

For most, healthy food is readily available at a reasonable cost and the variety of available foods is virtually limitless. Why doesn't the average Albertan family choose it more often? The answer could be that the average Albertan family hasn't yet made the connection between food and health, or they have received little or inconsistent nutritional education.

Alberta agriculture and food industries already produce a number of foods that are healthy. Nonetheless, there is a significant opportunity to increase availability of “healthy for you” products in the province and further diversify the agricultural economy.

Health care costs are rising at two or three times the rate of inflation. These costs are projected to increase even faster in the future due to a number of key trends — rising obesity rates, increasing rates of chronic disease (type 2 diabetes and cardiovascular disease), and an aging population.

There is a concern that the health care system as it currently operates is not sustainable and that we need to look at implementing a series of preventative measures to address this situation.

**It's time to ask: How can food and health address a growing number of public health concerns and chronic disease?**

**What changes must Alberta families make — along with governments, industry, and health care providers — to have a healthier future and, at the same time, offer economic development opportunities?**

**The Alberta food and health innovation framework brings us closer to this healthier future — improving health outcomes for our citizens as well as driving a stronger diversified Alberta economy based on “the healthy choice”.**

### A vision for Alberta's future:

Albertans benefit from producing and eating food that makes them healthier.

Alberta businesses participate in the global market place for healthy food products.

## 2.0 The Intersection of Global Food and Health Trends

Similar to Alberta, most countries are recognizing the need to improve population health. Many are focusing on food and lifestyle as a major determinant of health. Global trends in food and health are intersecting as countries work to improve health through food.

### Food Trends

- Growing recognition of food's contribution to individual and population health.
- Increased demand for locally produced and organic foods.
- Increased use of supplements and functional foods.
- Food security issues intersect with nutrition as healthier alternatives are often more expensive.
- Controversy surrounds marketing/distribution of less healthy foods.
- Increased consumer demand for convenience.
- Beverage and snack categories are the fastest growing food categories.
- Fruits, vegetables, and meats are showing only marginal growth.
- Increased focus on food safety.
- Increased use of food for self-treatment of health conditions.



## Health Trends

- Increasing rates of inactivity, malnutrition, overweight, obesity, and chronic disease.
- Increased obesity and chronic disease reduce life expectancy of today's children below that of their parents in many developed countries.
- Health costs increasing unsustainably.
- Aging population in developed countries.
- Growing recognition of importance of mental health.<sup>1</sup>
- Increased use of alternative medicine and dietary approaches to disease treatment.
- Ongoing health disparities among and within nations are linked to socio-economic status.<sup>2</sup>
- Injuries and infectious agents continue as major causes of death.<sup>3</sup>

## Global Food and Health Connections

- Through chronic disease, unhealthy food contributes to health care sustainability issues.
- Food and nutrition science provide avenues for addressing specific health conditions.
- Socioeconomic impact on food insecurity and disparity results in poor health.
- Cheap, energy dense, nutrient poor food contributes to obesity and chronic disease.
- Food and health sectors are increasingly aware of need for systems approach to health management.



<sup>1</sup> Cook, Derek. "Sustainability and Health for the City of Calgary: A Discussion of Global Health Trends and Local Impacts". Canadian Policy Research Networks. April 2006: p. 4. Accessed 31 May 2007 <[http://cprn.com/documents/42753\\_en.pdf](http://cprn.com/documents/42753_en.pdf)>

<sup>2</sup> "Emerging Threats". Global Health Council. Accessed 1 Jun. 2007 <[http://www.globalhealth.org/view\\_top.php3?id=229](http://www.globalhealth.org/view_top.php3?id=229)>.

<sup>3</sup> "Emerging Threats". Global Health Council. Accessed 1 Jun. 2007 <[http://www.globalhealth.org/view\\_top.php3?id=229](http://www.globalhealth.org/view_top.php3?id=229)>

## 3.0 Linking Agriculture, Food, and Health in Alberta

Our province has a distinct health framework as established by Alberta Health and Wellness. Likewise Alberta Agriculture and Rural Development has addressed agriculture/food policy.

Through Advanced Education and Technology, and with a focus on innovation, the ministries were brought together to develop a unified framework that establishes Alberta's key policy approaches in the area of food and health.

The Alberta food and health innovation framework supports the "Framework for a Healthy Alberta" to "improve healthy behaviors" and to "reduce chronic disease".

It helps "Growing our Future, An Integrated Life Sciences Strategy for Alberta" and "Alberta's Agriculture Research and Innovation Strategic Framework".

The framework reinforces the above strategies through the development of approaches to increasing innovation capacity and excellence that support health, food, and agriculture.

The current framework also supports Alberta's long-term vision of improved health, quality of life, and economic opportunity.

By developing a cross-ministry strategy, an overarching provincial approach can be developed that will provide a consistent direction. This collaboration will result in a greater level of success in improving food economics, health, and health system outcomes.

### Why is food so important to health?

Nutritious, affordable food is essential to life itself and plays a pivotal role in the health of individuals. Good nutrition allows for optimal growth and development throughout the individual's life.



## How can agriculture shift toward providing healthier foods?

Agriculture plays an important role within the food and nutrition system. Primary agriculture can provide the raw products and ingredients necessary for a healthy diet.

Food manufacturers can develop and reformulate products to meet nutritional guidelines.

The convergence of consumer demand and supply of healthy products can provide substantial growth in the agriculture and agri-food industries, if these industries can focus on becoming stewards of improved public health and social well-being.

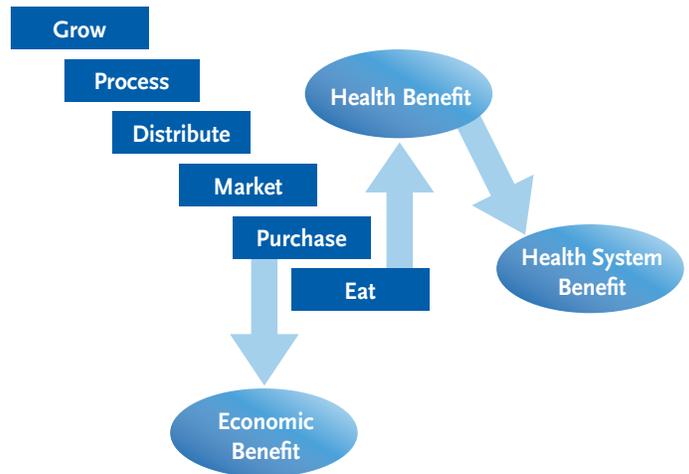
Furthermore, this market-driven form of agriculture provides products based on what consumers choose to eat to be healthy, rather than high volume production.

From the field to the fork, there is a need for innovation. The food system originates at crop selection/breeding to manufacturing/ processing food products, and then selling the product to the consumer utilizing the distribution, marketing, and retail channels.

Through agricultural and health sectors working more closely together, innovative solutions can be found to contribute to the overall goal of a healthy population. We want to change the nature of the food system to ensure that healthier products are available to, as well as purchased and consumed by, individuals.

As discussed above, the following diagram illustrates the areas in which innovation can take place to result in overall healthier food being available to consumers with a corresponding positive impact on the health care system.

## Food and Health System



Albertans have a rich cultural heritage, which influences the foods chosen. Many Albertans are tied to the land and the food it provides.

While Albertans live in a rich province, many are unable to eat healthfully for economic reasons or lack the understanding of what constitutes good nutrition. Finances affect what food one can afford and, similarly, poor nutrition can impact the ability to earn a living.

There is also a growing number of overweight or obese Albertans, who may benefit from information on healthy eating and active living to help them address their growing waistlines and become healthier.

## How does food affect productivity and quality of life?

### Children

In children, an unbalanced diet, especially when combined with low activity levels, can affect their health as adults by increasing the risk of osteoporosis, heart disease, some types of cancer, type 2 diabetes, and obesity.

Inadequate nutrition, in the short term, may affect concentration, energy levels, immunity, and mental health. The life long effects may restrict educational experiences and later adult productive capacity.

### Adults

For adults, being active and eating a healthy diet leads to better overall health, lower risk of disease, healthy body weight, stronger bones and muscles, more energy, and improved mental health. These attributes result in a higher quality of life and increased longevity. Society benefits as adults become more productive, both in the home and in the workplace.

The greatest costs associated with poor nutrition are the more intangible ones. In economic terms, these are the “opportunity costs” — the costs of lost opportunities in which productivity with financial benefits would otherwise occur.

The lost opportunity is the contribution that nutrition poor individuals might otherwise make to society as a whole and to the productivity and well-being of their families.

### Seniors

A healthier diet in combination with exercise has many positive impacts on seniors' quality of life. This quality of life can be expressed as the retention of their intellectual capacity, the ability to maintain themselves and their homes, and continued enjoyment of life.

The financial aspects of better health can also be reflected in fewer seniors developing chronic diseases, reduced costs in medications, reduced number of hospital visits, and fewer invasive health procedures.



## What is the effect on the health system with a healthier population?

Scientific research increasingly confirms that what we eat has a significant impact on our health, quality of life, productivity, and longevity.

Diet is a significant factor in the risk of heart disease, certain types of cancers, and stroke. Diet also plays a major role in the development of Type 2 diabetes, hypertension, and overweight conditions.

## Specifically, what is the gain to the health system by improving knowledge in food/meal preparation and healthy eating habits?

Morbidity and mortality associated with these chronic health conditions linked to unhealthy weights would be delayed, allowing for increased productivity, and prolonged higher quality of life.

Hospital visits, both short and long term, would decrease as a percentage of the population resulting in less pressure on medical care as well as institutional care.

Invasive procedures such as joint replacement, cardiovascular surgery, and cancer treatments could decline on a percentage basis as well.

Although these decreases may not result in lowering health care costs, it is anticipated that these changes may reduce the pressure on the health care system, and may ensure sustainability.

While prescription drug use is projected to increase, the rate of growth could decline as the population becomes healthier.

## How does connecting food and health result in improved economic outcomes?

Market trends have indicated that the healthy food market is growing, and the agriculture and food sectors have identified this as a key target market. The food health connection will provide opportunities for local companies to grow; producers to market even healthier/specialized products; and for Alberta to attract major international companies.

The goal of the framework is to attract and grow local companies in Alberta that will provide differentiated health based food products. These food products can be functional foods, natural health products, fresh unprocessed foods, as well as mainstream products with improved nutritional value.

Processed foods can also be improved both in terms of healthier ingredients, as well as processing practices. This health focused differentiation will optimize value for Alberta's primary producers and processors.

By increasing the number of ingredient companies, food manufacturers, and processors in Alberta and their ability to market and sell healthy food products, Alberta's economic base will grow.

To see a list of the major companies that are currently operating in Alberta, please refer to Alberta's Agricultural Processing Industry 2007 Directory, <http://www.agric.gov.ab.ca/app68/foodindustry?section=coName>.



## 4.0 Challenges and Opportunities for the Future in Food and Health

Food and health are intimately related, but in Alberta and elsewhere the food system and the health system are not well connected.

To achieve improved health and economic outcomes, this connection must be developed so that Alberta can address the fundamental challenges of food and health.

**The three challenges in Food and Health are:**

- Preventing chronic disease through healthy food, ingredients, and bioactives.
- Producing healthy foods that kids and adults will eat but not overeat.
- Improving the nutrition of a population.

To address these challenges, a wide variety of issues and opportunities must be considered:

### Issues

**The Complex Behavioral Challenge:**

Obesity — the result of excess calories and insufficient exercise — remains a major challenge. Too many Canadians do not eat healthy diets and consume insufficient fruits and vegetables. Purchasing decisions are influenced by external and internal influences. The biggest challenge to creating long-term change in nutrition is changing individual behavior through education and fostering motivation to make healthier eating choices.



**The Food Environment:**

Currently, the food environment in which consumers are immersed often supports unhealthy choices through reduced cost.

Energy dense foods (high calories with few nutrients — high fat and/or high sugar) are often considerably cheaper than high nutrient foods (fresh vegetables, fruits, nuts, fish, and meats).

The challenge is to make healthy foods more available and affordable relative to their energy dense alternatives.

**Knowledge for Change:**

Evidence is required to sell a healthy food based on health claims and for the health community to make recommendations regarding dietary approaches to health.

The current state of the evidence is vague and confusing to consumers and practitioners.

Improved capacity for efficacy testing would provide solid evidence of health effects.

Knowledge translation between researchers, companies, and end consumers would facilitate the translation of ideas and knowledge into products that will positively impact the health system.

**Opportunities****Capitalizing on Alberta's food/health assets:**

The region is particularly strong in several food products with known health benefits, including oilseeds, pulses, berries, cereal grains, and lean meats.

Industry capacity to research, develop, and commercialize products is building.

Several organizations and companies are committing to strategies in the food and health arena.

**Technology will fuel food/health convergence:**

New technologies and diagnostics are changing health management strategies.

Tools such as nutrigenomics are making it possible to develop personalized diet and health care strategies based on an analysis of the individual genome.

Development of tools and capacity is critical to success in health and food.

## 5.0 Alberta's Food and Health Innovation Framework

### Vision

- That Albertans benefit from producing and eating food that makes them healthier.
- Alberta businesses participate in the global market place for healthy food products.

### Mission

- To create world-leading food and health innovations that improves health and economic outcomes.

### Key Outcomes

- Government policy facilitates the development of new healthy foods and promotes healthy lifestyle choices, including the consumption of healthier foods.
- An efficient lab-to-industry innovation pipeline that results in development of new, Alberta-based healthy food products.
- Healthy food choices are affordable and readily available for purchase and consumption.
- Alberta's business environment stimulates the creation of many new commercially competitive healthy food and food products.
- Alberta's population is well-educated in nutrition and health outcomes.

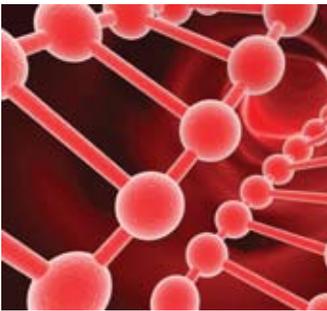


## Values

- Excellence in innovation and continuous improvement
- Industry partnership and collaboration
- Affordability and accessibility of healthy food
- Economic prosperity and a diversified Alberta economy
- Sharing knowledge and responsibility for achieving outcomes
- Integrity in the process through openness, honesty and fairness

## Key Assumptions

- There is a significant opportunity for Alberta to augment a competitive, sustainable agricultural economy with a focus on “healthy for you” products.
- The Government of Alberta has a role in creating an environment where healthy food is readily available and affordable for all income groups.
- To improve the health of the population, it is important to target the provision of healthy foods and premium products targeted to those customers most concerned about their health.
- A healthy, balanced diet improves both learning and productivity, helping Albertans to grow, thrive, and be productive.
- Improving nutrition of Albertans results in improved health status and health system benefits.





## 6.0 Achieving the Goals

To accomplish Alberta's food and health innovation goals in food requires the establishment of a sound framework that connects the innovation efforts and capacity of health, agriculture and food into an effective innovation system focused on Alberta's strategic goals and working in an environment that supports Alberta's food and health innovation outcomes.

The framework contains approaches (see page 13) spanning the continuum of innovation capacity and activities, from fundamental research to commercialization and non-commercial application of research results and technology, where innovation is defined as the creation and use of knowledge.

This framework identifies three primary goals. Within each goal there are key areas of focus. The areas of focus relate directly to the overall goals of improved health and economic outcomes for Albertans. A detailed action plan involving health, food/agriculture and innovation sectors will be developed within the next two years, and implemented through partnership with the key organizations in each area.

1. The first goal addresses the overall policy and business environment. This includes approaches to improve policy and business environments, secure leadership, and the exchange of ideas and innovations in the global marketplace. The desired outcome in this area is to develop Alberta's reputation as a leading food and health innovation destination – companies look to Alberta for solutions to complex food and health problems.
2. The second goal considers the innovation system – capacity including infrastructure, human resources, and linkages between key stakeholders. A key concept in this area is the development of a knowledge brokering system, where ideas are translated from the lab, to the development of products with manufacturers and retailers, through to the end consumer.
3. The final goal targets areas where Alberta can effectively focus to deliver significant innovations – advancing Alberta's food's health efficacy testing, development of products, changing the food environment, and innovation in education and social marketing to motivate and sustain consumer behavior change.



Alberta Food and Health Innovation Framework	
Goal	Focus Area
Alberta is a leading food and health destination.	Establish strategic focus for a forward looking food and health innovation agenda.
	Align policies related to food and health.
	Enable Alberta companies to commercialize healthy food products.
	Increase presence of Alberta food and health products, ideas and innovations in the global marketplace.
Alberta has a sustainable food and health innovation system with capacity to achieve improved economic outcomes, health outcomes and health system outcomes.	Enhance the knowledge brokering system that translates research from the lab into healthy food products.
	Develop, attract and retain excellent people.
	Align, connect and grow the existing and required innovation infrastructure. Apply new technologies (i.e. metabolomics, nutrigenomics, nanotechnology, etc.)
Alberta's food and health innovation system creates significant innovations in key areas.	Accelerate the development of healthy new food products and ingredients.
	Advance Alberta's food-health efficacy testing capacity.
	Pilot and implement improvements in the food environment to enable consumers to make better food choices.
	Foster innovations in education and marketing that result in consumer behavior change.

## 7.0 Success through Partnerships and Existing Capacity

Alberta has significant innovation capacity on which to position itself as a Canadian leader in the development of healthy food ingredients and products, which presents a significant benefit to local agricultural and health industries, as well as the population.<sup>4</sup>

As in the development of the framework, key partnerships and collaborations will occur across industry, academia, and government departments to implement the strategies identified in this document.

It is essential that multiple players bring their expertise to the project to develop the research agenda, assist in the knowledge brokering system, and participate in the development of new products.



### Potential partnering organizations include:

- University of Alberta
- University of Calgary
- University of Lethbridge
- Olds College School of Innovation
- Agriculture and Agri-Food Canada
- Alberta Agriculture and Food
- Alberta Agricultural Funding Consortium
- Alberta Food Processors Association
- Canadian Food Inspection Agency
- Leduc — Food Processing Development Center
- Institute for Food and Agricultural Sciences in Alberta
- Alberta Cancer Foundation
- Alberta Research Council
- AVAC Ltd.
- Alberta Heritage Foundation for Medical Research
- Canadian Diabetes Association
- Heart and Stroke Foundation
- Mazankowski Alberta Heart Institute
- Obesity Network
- Alberta Health and Wellness
- Dieticians of Canada
- Health Canada
- The Alberta Ingenuity Fund
- Alberta Prion Research Institute
- Alberta Ingenuity Centre for Carbohydrate Science
- AET Commercialization Team
- Alberta Employment Immigration and Industry

<sup>4</sup> "Health and Food Environmental Scan of Alberta Capacity and Expertise".

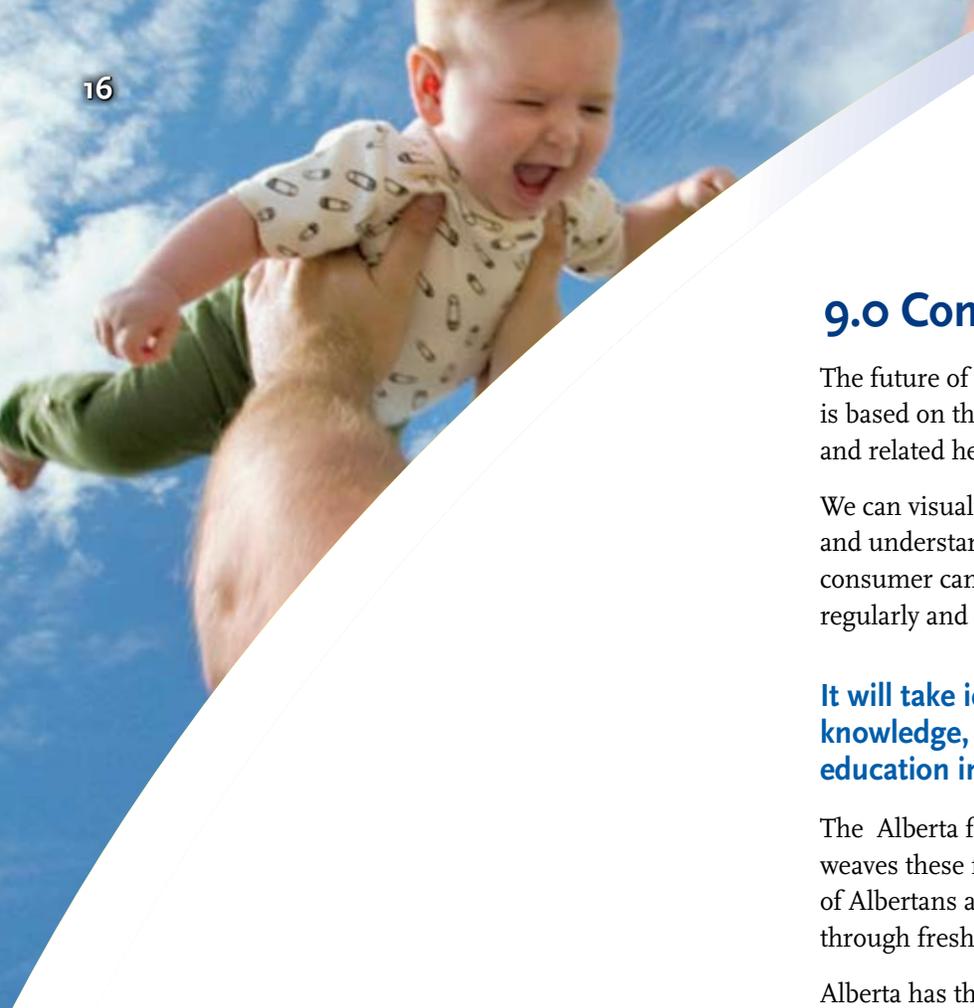
– NutriTech Consulting Inc. (December 2006).

## 8.0 Measuring Success

Success of this framework will be measured against economic and health outcomes. The following table provides both short-term and long-term measures that define the success of this framework.

Specific measures associated with the key outcomes of the framework include the following:

Food and Health Innovation Key Outcomes	Short-Term Measurable	Long-Term Measurable
Government policy facilitates the development of new healthy foods and promotes healthy lifestyle choices, including the consumption of healthier foods.	<ul style="list-style-type: none"> <li>– Enhanced Alberta participation and input into regional and national policy improvements and innovations.</li> </ul>	<ul style="list-style-type: none"> <li>– Reduced barriers to the introduction of healthy new food products that provide a competitive advantage to Alberta-based companies.</li> </ul>
An efficient lab-to-industry innovation pipeline that results in development of new, Alberta-based healthy food products.	<ul style="list-style-type: none"> <li>– Increased number of collaborative multi-disciplinary projects.</li> <li>– Increased number of products tested for health attributes.</li> <li>– Increased number of healthy foods being produced .</li> </ul>	<ul style="list-style-type: none"> <li>– Well established connections between researchers, industry, and consumers.</li> </ul>
Healthy food choices are affordable and readily available for purchase and consumption.	<ul style="list-style-type: none"> <li>– Food environments result in the healthy choice being the “easiest choice.”</li> <li>– People make healthier choices more often.</li> </ul>	<ul style="list-style-type: none"> <li>– Increased number of healthy weight adults and children.</li> <li>– Reduced incidence of chronic disease</li> </ul>
Alberta’s business environment stimulates the creation of many new commercially competitive healthy food and food products.	<ul style="list-style-type: none"> <li>– Increased investment in the development of healthy food products.</li> <li>– Increased shipments of healthy food products.</li> <li>– Increased number of companies producing healthy food products.</li> </ul>	<ul style="list-style-type: none"> <li>– Increased growth in Alberta’s food industry.</li> <li>– Alberta participates in the global healthy food market.</li> </ul>
Alberta’s population is well-educated in nutrition and health outcomes.	<ul style="list-style-type: none"> <li>– Increased number of strategies to inform and motivate the public to make healthy food choices.</li> </ul>	<ul style="list-style-type: none"> <li>– Increased understanding by Albertans of healthy eating and improvement in eating behaviors, with a resulting improvement in population health outcomes.</li> </ul>



## 9.0 Conclusion

The future of improving health and wellness of Albertans is based on the sound understanding of nutrition, food, and related health outcomes.

We can visualize a healthier society where people know and understand the food health connection. The Alberta consumer can make better lifestyle choices — exercising regularly and making healthier food choices.

**It will take ideas, research, innovation, knowledge, product development, marketing, and education in food and health.**

The Alberta food and health innovation framework weaves these factors together to improve the health of Albertans and drive a diversified agricultural sector through fresh, local, healthy food products.

Alberta has the innovation capacity on which to position itself as a Canadian leader in the development of healthy food ingredients and products.

By addressing the identified challenges and implementing forward thinking solutions, positive health outcomes for Alberta can be achieved.

The framework sets out a plan to achieve success. The next steps of this project is to develop a five year action plan that will identify the activities, budget, resource requirements and project milestones needed to implement the strategies identified in the framework.

Long-term success will require a solid foundation of partnerships among the players in the food and health system.



## 10.0 Glossary

### Food fortification:

**Food fortification is the addition of vitamins and minerals to food to help:**

- Protect Canadians against nutritional deficiencies — for example, requiring all milk to be fortified with vitamin D virtually eliminated childhood rickets since the 1970's;
- Maintain and improve the nutritional quality of the Canadian food supply — for example, enriching flour with B vitamins and iron replaces those same nutrients lost in processing;
- Reduce the risk of diet-related chronic diseases — for example, fortification contributes to adequate intakes of calcium and vitamin D which help build strong bones and may reduce the risk of osteoporosis.

**Source:** Health Canada

[http://www.hc-sc.gc.ca/fn-an/nutrition/vitamin/fortification\\_factsheet1-fiche1\\_e.html](http://www.hc-sc.gc.ca/fn-an/nutrition/vitamin/fortification_factsheet1-fiche1_e.html)

### Functional Food:

A *functional food* is similar in appearance to, or may be, a conventional food that is consumed as part of a usual diet, and is demonstrated to have physiological benefits and/or reduce the risk of chronic disease beyond basic nutritional functions, i.e. they contain bioactive compound.

**Source:** Agriculture and Agri-Food Canada

<http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1171305207040&lang=e>

### Health:

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.<sup>1</sup>

The definition was updated in the 1986 WHO “Ottawa Charter for Health Promotion” to say health is a “resource for everyday life, not the objective of living”, and “health is a positive concept emphasizing social and personal resources, as well as physical capacities.”<sup>2</sup>

**Source:**

1. WHO. “Constitution of the World Health Organization” *World Health Organization*; 2006

2. ^ WHO. [1], *The Ottawa Charter for Health Promotion*, Ottawa, 1986.

### Healthy:

Beneficial to health: helping to maintain or bring about good health i.e. *healthy diet*

**Source:** Dictionary [http://encarta.msn.com/dictionary\\_1861617022/healthy.html](http://encarta.msn.com/dictionary_1861617022/healthy.html)

### Healthy Diet:

Healthy diet is the practice of making choices about what to eat with the intent of improving or maintaining good health. This usually involves consuming nutrients by eating the appropriate amounts from all of the food groups, including an adequate amount of water. Since human nutrition is complex, a healthy diet may vary widely, and is subject to an individual's genetic makeup, environment, and health. For around 20% of the human population, lack of food and malnutrition are the main impediments to healthy eating. Conversely, people in developed countries have the opposite problem; they are more concerned about obesity.

**Source:**

[http://en.wikipedia.org/wiki/Healthy\\_diet](http://en.wikipedia.org/wiki/Healthy_diet)

### Healthy Food:

A “healthy” food must be low in fat and saturated fat and contain limited amounts of cholesterol and sodium. In addition, if it's a single-item food, it must provide at least 10 percent of one or more of vitamins A or C, iron, calcium, protein, or fiber. Exempt from this “10-percent” rule are certain raw, canned and frozen fruits and vegetables and certain cereal-grain products. These



foods can be labeled “healthy,” if they do not contain ingredients that change the nutritional profile, and, in the case of enriched grain products, conform to standards of identity, which call for certain required ingredients. If it’s a meal-type product, such as frozen entrees and multi-course frozen dinners, it must provide 10 percent of two or three of these vitamins or minerals or of protein or fiber, in addition to meeting the other criteria. The sodium content cannot exceed 360 mg per serving for individual foods and 480 mg per serving for meal-type products.

**Source:** Excerpted from FDA Backgrounder, May 1999: The Food Label.

<http://www.cfsan.fda.gov/~dms/qa-lab8b.html>

### Innovation:

Innovation is the creation, development and implementation of a new product, process or service, with the aim of improving efficiency, effectiveness or competitive advantage. Innovation is linked to creativity and the creation of new ideas, and involves taking those new ideas and turning them into reality through invention, research and new product development.

**Source:** “The Digital Strategy: Glossary of Key Terms.” 10 April 2008.

<http://www.digitalstrategy.govt.nz/Media-Centre/Glossary-of-Key-Terms/>

### Innovation System:

The Innovation system includes not only Research and Development, but also the dissemination, commercialization, and application of knowledge and technology. Although government and the universities are major players in the Innovation system, the largest role is played by enterprises in the private sector that convert technology into products and services that produce socio-economic benefits...

**Source:** “The Innovation System is Critical to Development of Alberta’s Knowledge Resource.” 14 April 2008

<http://www.asra.gov.ab.ca/resources/publicdocs/sustain/suso2.html>

### Natural Health Product:

Natural Health Products include vitamins and minerals, herbal remedies, homeopathic medicines, traditional medicines, such as traditional Chinese medicines, probiotics, and other products, such as amino acids and essential fatty acids. As a product group, NHPs include nutraceuticals.\*

**Source:** Natural Health Products Directorate, Health Canada

[http://www.hc-sc.gc.ca/dhp-mps/homologation-licensing/gloss/index\\_e.html](http://www.hc-sc.gc.ca/dhp-mps/homologation-licensing/gloss/index_e.html)

\*A *nutraceutical* is a product isolated or purified from foods that is generally sold in medicinal forms not usually associated with foods. A *nutraceutical* is demonstrated to have a physiological benefit or provide protection against chronic disease.

### Evidence-based Approach to Decision Making:

Is the use of high-quality evidence to make informed choices. High-quality evidence is scientific, experiential, and includes other types of evidence deemed appropriate.

**Source:**

[http://www.hc-sc.gc.ca/dhp-mps/homologation-licensing/gloss/index\\_e.html](http://www.hc-sc.gc.ca/dhp-mps/homologation-licensing/gloss/index_e.html)

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