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Consumer Market For Bone Health Benefits: Is it a waiting opportunity for the Alberta functional food and nutraceuticals industries?

# **CONSUMER MARKET FOR BONE HEALTH BENEFITS: IS IT A WAITING OPPORTUNITY FOR THE ALBERTA FUNCTIONAL FOOD AND NUTRACEUTICALS INDUSTRIES?**

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## **Abstract**

In recent years, consumers and the agri-food sector have begun to look at food not only for basic nutrition, but also for health benefits. The market for functional foods and nutraceuticals is being driven by a growing consumer understanding of diet/disease links, aging populations, rising health care costs, and advances in food technology and nutrition. Functional foods are one of the fastest growing segments of the food industry. The focus of this report is on bone health. This report provides an insight into the current status and future potential of the global market for bone benefit foods and drinks. Opportunities for Alberta agriculture, food and beverages industries are also discussed.

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## Introduction

In recent years, consumers and the agri-food sector have begun to look at food not only for basic nutrition, but also for health benefits. The market for functional foods and nutraceuticals (FFN) is being driven by a growing consumer understanding of diet/disease links, aging populations, rising health care costs, and advances in food technology and nutrition. Functional foods are one of the fastest growing segments of the food industry.

Globally, functional foods represent \$56 billion in sales, led by the U.S. with \$18.5 billion, Europe with \$18 billion, and Japan, the oldest and most established market, with \$14 billion, according to Nutrition Business Journal (2002). Worldwide, sales of functional foods grew approximately 7% in 2001, with growth of 7%-8% anticipated through 2010. Combined, the U.S., Japan and European functional foods markets represent over 90% of global sale (Nutrition Business Journal, 2002)

In Alberta, FFN value of shipment averaged \$30 Million in 2001 and there is a reasonable potential for achieving a total value of shipment of \$1 Billion by 2010.

FFN are being used to prevent and/or treat a variety of diseases and health conditions. The focus of this paper is on bone health. This report provides an insight into the current status and future potential of the global market for bone benefit foods and drinks. Opportunities for Alberta agriculture, food and beverages industries are also discussed.

## Bone Health Market Opportunities

With an aging population and greater awareness of the problems of bone health of older people (in particular osteoporosis), greater emphasis is and will continue to be placed on bone benefit foods. The World Health Organization has defined osteoporosis as the second leading health care problem after cardiovascular disease, affecting more than 200 million women worldwide. The market for bone benefits foods is growing at just over 4% per annum (Leatherhead Food RA, 2002) and is expected to grow significantly (Table 1).

**Table 1: Global bone health foods market, 2000-05 (excluding Japan, in US \$millions)**

Growth	2001 market value	2005 forecast value	% change
Dairy products	\$715	\$870	+22
Soy products	\$632	\$785	+24
Cereal products	\$355	\$462	+30
Total	\$2160	\$2697	+25

Source: Leatherhead Food RA (2002)

According to Leatherhead Food RA (2002), the four largest and most developed bone-health categories (cereal products, soft drinks, soy milk and dairy) will continue to account for the bulk of sales, with cereals set to show the strongest growth. Soft drinks will see the next biggest increase, reflecting the move by multi-nationals to take calcium-fortified juices to Europe to try to replicate their success in the US, and also the arrival of mainstream calcium-fortified water in Europe. Calcium fortification has become increasingly popular across a wide range of food and drinks over recent years, particularly in Japan.

## Europe

Fortification with calcium is now relatively commonplace in Europe across a wide range of foods and drinks products. With the growing recognition of the problem of osteoporosis, manufacturers across Europe have been more proactive in linking calcium-fortified products to bone health. Key development in the sector since the beginning of 1999 included the launch of the Aviva range, which included three products in its Bone Benefits range with Nova Calcium, the active promotion of calcium fortification in breakfast cereals, and the growing use of calcium fortification in drinks.

## USA

The USA has seen considerable activity in calcium-fortified foods and drinks in recent years. There have been two particularly key developments - The use of calcium fortification for breakfast cereals (led by Kellogg) and the development of calcium chews that appear to straddle the line between foods and dietary supplements. Supplementing calcium through food and/or supplements entitles manufacturers to a US Food and Drug Administration-authorized health claim that the product "maintains good bone health and may reduce the risk of osteoporosis later in life."

Although most people know they need dietary calcium for bone health, the actual consumption of calcium-rich foods is far too low. By some estimates, in the United States more than 90% of women, 60% of men, 70% of infants and 66% of children are calcium deficient (Quillici-Timmcke, 2002). There is a substantial gap between the recommended daily calcium intake and what people actually consume. To counter this disparity, an increasing number of functional foods with added calcium are entering the market with the potential to significantly improve the statistics.

## Japan

The Japanese national diet is deficient in calcium, and the Japanese health authorities were concerned about this, particularly for children. As a result, calcium-fortified products became one of the most important types of functional food and drinks in the country. Most recently, calcium absorption promoters such as casein phosphopeptides (CPP) and calcium citrate malate (CMM) have also been increasingly used in a range of products.

Attention has also turned to the adult market and the prevention of osteoporosis. Ingredients with this type of benefit include the non-cariogenic sweetener trehalose, and soya isoflavones (which promote calcium absorption), as well as the more traditional vitamin D.

Although the dairy market is an obvious target for calcium fortification, with the natural calcium content of many products, calcium fortification also features in most sectors of the food and drinks market, including beverages, bakery products, meat and fish products, and prepared foods of all types.

According to Leatherhead Food RA (2000), the latest ingredients to become popular in this sector are glucosamine and chondroitin, used in combination to prevent degeneration of cartilage in bone joints. A number of supplements are now on the market, and use in food and drinks products, particularly for the elderly, may follow.

The Japanese consumer interest in increasing calcium intake to help build and maintain strong bones and to help prevent osteoporosis has resulted in the introduction of many functional foods, including Foods for Specified Health Use (FOSHU) approved by the Ministry of Health and Welfare (MHW) and non-FOSHU foods fortified with calcium-containing ingredients (Bailey, 1999).

Soy isoflavones and osteoporosis is a relatively new area of interest in Japan. It has been developed in part based on awareness of the clinical study evidence developed outside Japan for the prevention of osteoporosis using soy-based ingredients and extracts. Several Japanese companies have now entered the marketplace with their soy isoflavone concentrates, positioned generally for post-menopausal women seeking to help prevent osteoporosis. One soy isoflavone from Fujicco has been "approved" for use in FOSHU food products, although so far none of the approved FOSHU products are using soy isoflavones as the active ingredient. (Bailey, 1999)

## Canada

The Canadian population is aging and the proportion of seniors in the population is expected to reach 17.8% (6.9 millions) by 2021. As the population is aging, bone health issues become of great concern. For instance, according to Health Canada (2003), 25% of women over age 50 and 50% over age 70 will develop osteoporosis. Seven in ten fractures in those over the age of 45 are due to this disease.

Over the last ten years, osteoporosis has gone from being virtually unrecognized by the public to being a source of significant concern and even fear, particularly to women in their midlife and senior years. The morbidity, mortality, and cost to the health care system, estimated to reach 32.5 billions over the next 2 decades, resulting from poor bone health, is significant and certainly a legitimate source of concern (Health Canada, 2003)

Statistics Canada data on calcium and vitamin D, two important nutrients for adequate bone health, show that between 1991 and 2001 average vitamin D intake per person has decreased at an average of 0.7% per year; while average calcium intake per person has increased at an average rate of only 0.3% per year (Statistics Canada, 20003a). However, it is expected that the intake of these 2 nutrients would increase as recent health claims associating strong bones and reduced risk of osteoporosis has been adopted by Health Canada.

**Table 3: Canadian per capita intake of vitamin D and calcium, 1991-2001**

Category	1991	2001	Average growth per year (%)
Vitamin D (mcg)	4	3.7	-0.75
Calcium (mg)	687	709	0.32

Source: Statistics Canada, 2003a.

## Opportunities for the Alberta agriculture, food, and beverages industries

According to Leatherhead Food RA (2002), more women die from osteoporotic fractures than die from breast cancer, and approximately 200 million women worldwide are estimated to have osteoporosis. With the current prevalence of osteoporosis, effective preventive measures need to

be developed. This situation offers opportunities for the development of functional bone benefit foods, provided the products are supported by good scientific studies and data.

It would appear unlikely that developing products that are enriched with calcium only would be successful in the market place as the competition is very high especially from already established products produced by well-known multinational companies. Hence, for Alberta to enter this highly competitive market, the best opportunities might not be in calcium-fortified products offering **only** bone health benefits.

However, it appears that there is a potential niche market for calcium-enriched fresh fruits and vegetables. This is supported by (1) the upward trend observed in Canada and the USA with regards to consumption of fresh fruits and vegetables, (2) the perception by consumers that fresh fruits and vegetables are healthy, (3) the existing in the USA of approved health claims regarding the consumption of fresh fruits and vegetables, and (4) the existence of a segment of the population who cannot tolerate lactose in dairy products.

According to Statistics Canada (2003b), average per capita fresh fruit consumption in Canada has increased 16% between 1991 and 2002 (Table 3). During the same period, average per capita vegetable consumption increased 7.5%. Similarly, in the USA, average per capita consumption of fresh fruits and vegetables increased 11.8% and 23.1%, respectively between 1990 and 2000 (Table 4).

**Table 4: Canadian per capita consumption of fresh fruits and vegetables (kg), 1991-2002**

Category	1991	2002	% change (1991-2002)
Fresh vegetables	130.0	139.5	7.5
Fresh fruits	58.1	67.5	16

Source: Statistics Canada 2003b.

**Table 5: US per capita consumption of fresh fruits and vegetables (% of change, 1990-2000)**

Category	Growth, 1990-2000 (%)	Average growth per year (%)
Fresh vegetables	23.1	1.1
Fresh fruits	11.8	2.1

Sources: Economic Research Service, USDA, 2001.

On the other hand, it would appear that the best prospects for Alberta agriculture, food, and beverages industries are in developing innovative multi-functional products (i.e. products that provide more than one health benefit). It would appear that this is the area where Alberta should focus their product development efforts and resources. For instance, one innovative product could be the use of calcium fortification along with other functional ingredients such as prebiotics and isoflavones which are not only calcium-absorption promoters but also provide other health benefits other than bone health benefits. Similarly, there are also opportunities for developing innovative multifunctional products combining the benefits of calcium and some prebiotics, especially inulin and oligofructose. Inulin and oligofructose are by far the most

widely studied prebiotic fibres in the world. In recent studies, enriched inulin preparations resulted in increased calcium absorption in adolescents. The same effect for calcium and magnesium was confirmed in post-menopausal women, a specific risk group for osteoporosis. In the area of dairy products for instance, it would be possible to develop products combining the benefits of probiotics, prebiotics and calcium (i.e. gut health and bone and tooth health). In fact, prebiotics could play a role as (1) an agent to promote absorption of calcium, (2) an agent to promote the growth of probiotics, (3) a soluble fiber or even a sweetener.

In developing these new products, it is very important for manufacturers to remember that taste, convenience, and price are usually ranked very high by consumer as a criterion for making their purchasing decision. Therefore, consideration should be given to these three components.

The agricultural raw materials to be used in development of the new bone-health products may be sourced from a range of different traditional industries and commodities such as grains and cereals, fruit and vegetables, and dairy products.

Furthermore, as opposed to many other potential functional food products, there are established health claims related to calcium and its role in preventing and managing some bone health conditions in domestic and many international markets. These health claims in favor of calcium represent a boost to developing innovative products with the objective of preventing and managing specific bone health conditions.

## **Target Market: Market Segmentation**

Product development is increasingly focusing on targeting specific sectors of the market. Recently the development of products for the specific nutritional needs of women has been one of the most active areas.

The most obvious target market for bone health benefit food would be men and women over 50, as this segment of the population is more vulnerable to bone health issues and is more likely to buy functional food.

According to a consumer study in the USA by Health Focus International (2003), 46% of all women are extremely or very concerned about osteoporosis. These women along with the 20% of all men concerned about osteoporosis make up the Osteoporosis Target.

The other two groups that make up the bone health target are the Growth and Development Target and the Bone Wellness Target. The Growth and Development Target is identified by the fact that they have children under 18 years old. They are also the youngest of the three targets. The Bone Wellness Target is concerned by wellness and they look to promote the building of strong bones.

## **Conclusion**

Significant growth opportunities for the agriculture, food and beverage processing industries exist within the expanding bone health domestic and international markets. Alberta has the potential and should be able to take advantage of this growing market. The domestic consumption of food and beverage has been and will continue to be the most important market

for the vast majority of Canadian agriculture and food sectors. (with exceptions, e.g., exports of Canadian wheat and oilseeds exceed domestic use).

The domestic market is highly competitive with well-informed consumers interested in trying new and different products. Success in meeting the changing and challenging requirements of the domestic market could help position the food and beverage processing sector to extend this success to similar international markets.

The primary geographic opportunities are as follows:

- **North America:** While Mexico will offer many opportunities in the long term, the US will remain Canada's primary focus for export expansion in the foreseeable future.
- **Asia-Pacific:** With rising incomes, there will be increased prospects for marketing processed food products throughout the entire Asia-Pacific market, with annual growth in consumption expected at 5% to 7%. Japan, China and Korea are the primary markets of interest. Japan is Canada's second largest export market for food products, and is the world's largest net importer of food and agricultural products. Much of the future growth in the Japanese market is expected to be in consumer-oriented value-added products.

Finally, it would appear that there are more significant prospects for Alberta industries in developing innovative multi-functional foods rather than mono-functional health-bone food only.

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