Session 6

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Functional Foods: Global Overview and Future Innovation

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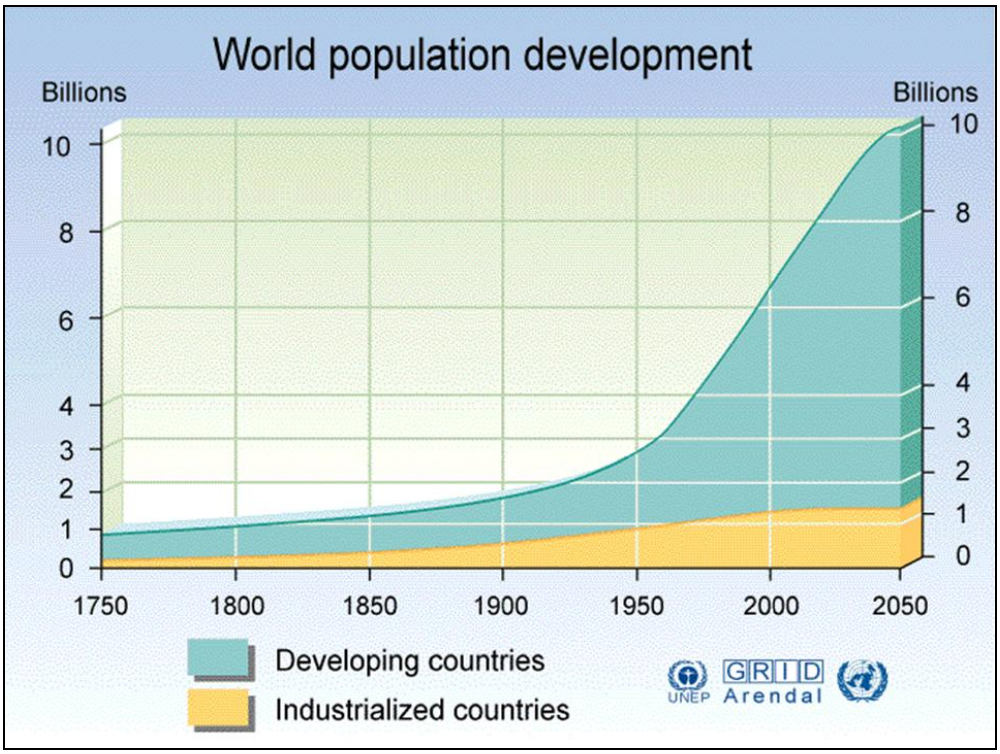
Abstract

Today's market for functional food is enormous. Currently, estimates consider that the strictly defined functional food and drinks market of developed countries represented $16.1 Billion and broadly-defined was $36.2 Billion (Leatherhead, 2005). Different sources will identify different figures, but the market for such products exists in the Billions of dollars. Three main categories of these foods exist – Supplements of pills, Food with added functional ingredients and Food or milk produced from animals improved by the way in which these animals have been raised or fed. Materials commonly used include Probiotics, Immunobiotics, Nucleotides, Selenium Yeast, Chelates, Prebiotics, Omega-3, Herbal and Plant extracts, and Essential oils. The health benefits of such foods for the consumer is the subject of media and scientific speculation, and the regulatory environment is not well defined but the price premium which such products command must be appreciated by agriculture and used to attain more value-added in marketing food and milk products.

A Booming Population

As the planet's population grows, the agricultural landscape and food product companies will need to work more efficiently to feed its citizens. The world population increased from 3 billion in 1959 to 6 billion in 1999, a doubling over 40 years. Current statistics show the world's population is projected to grow to 10 billion by 2050 (Population Reference Bureau, 2008).



Emerging markets such as Brazil, Russia, India and China are becoming more prosperous and their citizens are demanding more from the food chain in the way of milk and dairy products, and protein from meat. Consumers in developing countries and the 'western' world are also becoming more aware, or educated, on the importance of nutrients in the diet and their impact on health. Food animal producers and food product companies are tapping in to this trend and producing enriched or functional products to take nutrition to a whole new level.

Functional Foods

By definition, a food can be regarded as functional if it is satisfactorily demonstrated to beneficially affect one or more target functions in the body, beyond adequate nutritional effects in a way which is relevant to either an improved state of health and well-being and/or the reduction of risk of disease (Nils-Georg Asp, Lund University, Sweden, 2007). Functional foods is not a new term, but has evolved in its profile and status over the years.

Historically, functional foods originated in Japan in response to clearly identified public health needs, such as the need for more calcium and fibre in Japanese diets. The term was first used in Japan in the 1980s, where there was a government approval process for functional foods, called Foods for Specified Health Use (FOSHU).

Finland & Sweden also have a strong tradition of pre-emptive healthcare, including diet and health related messages that have been part of their public health efforts since 1970s.

The majority of functional foods started out as focusing on reducing the risk of diseases of deficiency. In the latter part of the twentieth century, consumers began to focus on wellness and the reduction of chronic disease. Research shifted to the promotion of health through many lifestyle factors, including the consumption of an optimal diet. As of 2002, researchers identified hundreds of food components with functional qualities, and they continue to make new discoveries surrounding the complex benefits of such components in foods (Encyclopedia of Food & Culture, 2003).

Functional attributes can be applied to traditional food agricultural products, such as milk, meat and eggs, to more processed and developed products such as yogurt, cheese, beverages, bars, snacks and confectionaries.

Driving Factors

There are several factors driving the development of functional foods around the world. Globalization, urbanization, business opportunities, science, emerging technology, the aging population, changing regulations and increased health care costs are just a few. The key factor, however, boils down to consumers or consumer interests. The majority of consumers are interested in the following:

- The relationship between diet and health
- Effects of the aging process
- Prevention or management of specific physical or health conditions
- Lifestyle, energy and/or mood enhancement
- Sports performance
- Health and nutrition of children, women and minorities

- Weight, satiety and appetite suppression
- Nutritional effects of organic or 'natural foods'

Key health concerns include:

- Obesity and Type II Diabetes
- Cancer (Gastrointestinal, Lung, Prostrate)
- Heart Disease
- Age-related macular degeneration
- Bone Health

Tiredness, stress and weight management are common health challenges for consumers all over the world. Certain parts of the world are faced with more serious concerns, such as obesity, cancer, heart disease, osteoporosis about cancer and obesity.

Global Consumer Health Problems (Health Focus International Consumer Trend Survey, 2003).

Summary	USA	Central Asia	China	Mexico/ Latin America	Europe
Most common health problems	Tiredness Stress Overweight Allergies	Overweight Cosmetic signs of aging Tiredness Freq. colds/flu	Freq. colds/flu Osteoporosis Tiredness Arthritis	Overweight Stress Freq. colds/flu Tiredness	Tiredness Stress Overweight Freq. colds/flu

Many of these health challenges are linked, such as Obesity and Type II Diabetes. Obesity has emerged as health threat around the world. For example, in the USA (Collins, 2007):

Obesity Rates Reach Epidemic Proportions	Obesity Related Diseases
• 58 Million Overweight • 40 Million Obese • 3 Million morbidly Obese • 8 out of 10 people over 25 years old are overweight • 78% of Americans not meeting basic activity level recommendations • 25% Completely sedentary • 76% Increase in Type II diabetes in adults 30-40 yrs old since 1990	• 80% of Type II Diabetes related to obesity • 70% of Cardiovascular disease related to obesity • 42% Breast and Colon cancer diagnosed among obese individuals • 30% of Gall bladder surgery related to obesity • 26% of Obese people having high blood pressure

Childhood obesity is also at an all time high with associated hospital costs rising from $35 Million (1979) to $127 Million (1999) (Collins, 2007).

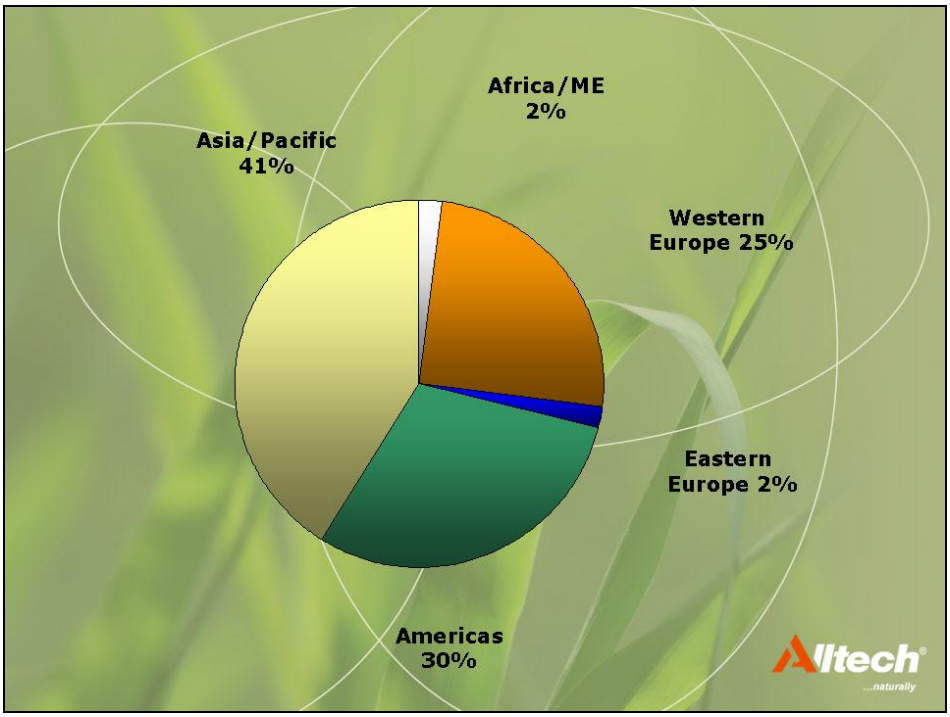
Global Market for Functional Foods

As consumers are looking to nutritionally upgrade their dietary intake and improve their health, food companies around the world are looking to capitalize on this connection. While competition exists between multinational corporations and raw material sources are more greatly diversified, the overall market for functional foods is promising.

Currently, the market for functional foods is estimated to be $7-$63 Billion USD, which differs from an estimated $36.2 Billion indicated by different source (Leatherhead, 2005). Again, different sources will identify different figures, but the market for such products exists in the Billions of dollars. Growth is expected to reach $167 Billion USD by 2010. Current global growth rate is likely to reach approximately 14% annually through 2010 (Global Market Review of Functional Foods - Forecasts to 2010, www.marketresearch.com, 2004). Key product categories driving this growth include dairy, beverages and bars. Global sales percentage breakdown by functionality:

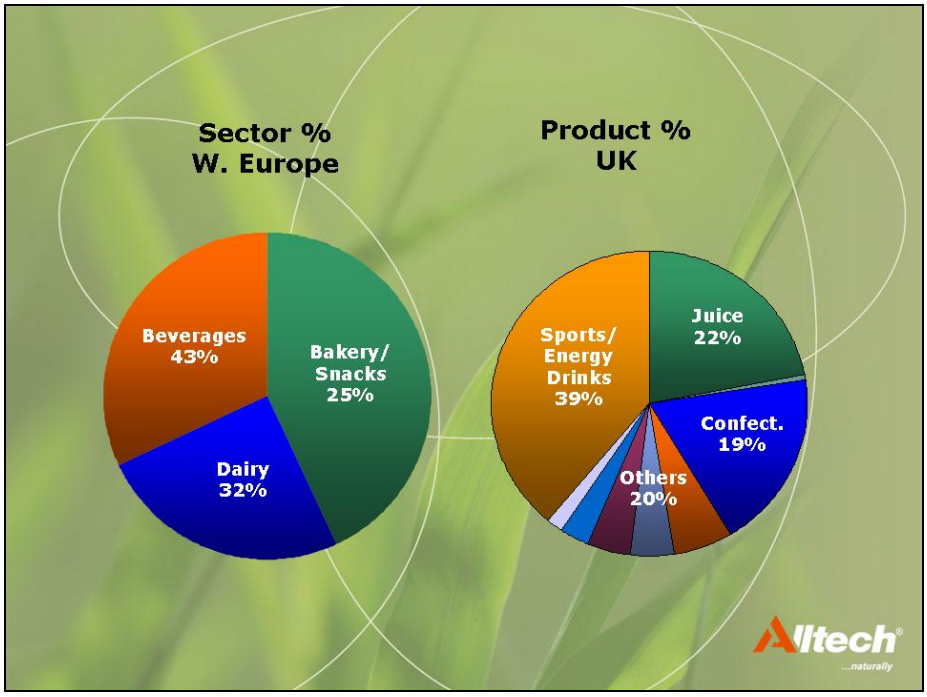
- Added vitamins & minerals 19%
- Added calcium 10%
- Intestinal Health 18%
- Cholesterol lowering 2%
- Sports/Energy 42%
- Other 9%

Major global markets divided by region and key countries include (Murphy, 2003):



Key Countries	$ Billion USD
Japan	11.7
USA	10.2
UK	2.2
Germany	2.1
France	1.6
Italy	1.5
Brazil	1.5

In the European Union, the Western European market shows an interesting distribution among key sectors and the United Kingdom hosts some of the key players across the continent (Murphy, 2003):



Key players in the United Kingdom:

- GlaxoSmithKline 31%
- Wrigley 8%
- Red Bull 8%
- Danone 5%
- Britvic 5%
- Cadbury 5%
- Coca-Cola 5%
- Masterfoods 4%
- Unilever 3%
- Procter & Gamble 3%
- Others 25%

Top ten global players (Murphy, 2003):

Company	Main Sector	Key Brands
1. PepsiCo	Beverages	Gatorade, Tropicana, Propel
2. Coca-Cola	Beverages	Powerade, Minute Maid
3. Otsuka	Beverages	Pocari, Calorie Mate
4. Yakult Honsha	Dairy Products	Yakult
5. Groupe Danone	Dairy Products	Actimel, Bio, Danone Activia
6. GlaxoSmithKline	Beverages	Lucozade, Horlicks
7. Cadbury Schweppes	Confectionary	Halls
8. Morinaga	Dairy Products	Mammy, Bifidus

9. Nestle	Beverages & Snacks	Milo, PowerBar
10. Kirin Brewery	Beverages	Amino Supli

Spotlight on Group Danone and the Activia brand (European Food & Agribusiness Seminar; Ederer & Ingenbleek, 2007):

Key success criteria for companies and brands in the functional foods market include:

- Mass market positioning
- Extension of existing brand
- Focus on general well being
- Effective communication of health benefits
- Focus on taste, convenience and price
- Discuss a health benefit addressing a common complaint
- Mass distribution and multiple retailers

On the Horizon

Again, while the concept of functional foods is not new, the profile and status of such products has and will continue to evolve. Much of this is due to trends in the marketplace and consumer preferences, health related or otherwise. Ten mega trends identified are (Murphy, 2003):

1. Health is the 'future of food'
2. Intrinsic Health: All foods are fast becoming functional
3. The concept of 'good foods' and 'bad foods'
4. Good carbs, bad carbs and the Glycemic Index
5. Personalised nutrition
6. The rise of bars and beverages

7. Packaging innovation and the daily dose concept
8. From supplements to beverages
9. The influence of Asia in health leadership
10. Obesity and the nutrition crisis of children

Alternative trends related to health and other preferences are:

Related to Health	Not Related to Health
• Organic Food • 'Better for you food', e.g. low fat, sugar-free, low carb • Naturally healthy foods, e.g. oats, soy, teas, cranberries • Foods for specific diets, e.g. 'free from'	• Indulgence, e.g. premium flavours • Convenience, e.g. ready meals, portable foods, single-serve portions • Ethnic foods and flavours

Ingredient Innovation

While ingredients can be added to processed foods, what about enriching or enhancing food products from traditional agricultural products such as milk, meat and eggs? Ingredient innovations from Alltech® that have been incorporated in the global food chain include:

Sel-Plex®: This antioxidant powerhouse enables food agriculture producers to naturally and nutritionally enrich milk, meat and eggs with a safe and traceable form of organic selenium, an essential nutrient. Sel-Plex has also been incorporated into dietary supplements and supplemental foods.

Bio-Mos® FG: This natural immunosaccharide addresses gastrointestinal health and balance. Bio-Mos FG provides digestive functionality and also is applicable for product taste, consistency and has been included in dietary supplements.

Excel Prime™: This natural, functional vegetable protein is highly digestible and palatable, and nucleotide-rich. Excel Prime has been incorporated in infant formulas, snacks, soups and other foods for healthy protein intake and taste enhancement.

Mycosorb®: This natural, patented, broad spectrum adsorbent is a standard in toxin management. Mycosorb has been proven to remove toxins in the food and beverage chains, with applications in milk, beer, wine, grains and cereals.

Bioplex®: This range of organic, chelated minerals (Iron, Manganese, Zinc) optimizes mineral status as they are better retained and used by the body. Bioplex minerals have been incorporated in dietary supplements and at the farm level resulting in mineral-rich food products.

Allzyme® Series™: This unique plant based enzyme groups provides consumption comfort for those tricky foods (e.g., lactase for the lactose intolerant).

All of these brands are manufactured at specific Alltech food-grade production facilities ensuring high quality, safe and traceable ingredients for food agriculture and processing companies alike. These brands are also backed by almost 30 years of scientific research.

Future of Functional Foods

It is a fact that functional foods provide health benefits that go beyond basic nutrition. Several factors are driving the interest in such products at a global level, and consumers are increasingly more health conscious and making the connection between diet and health. Functional Foods are not magic bullets. Lifestyle factors such as exercise and consuming certain foods in moderation will also contribute to overall health and well being.

Strong scientific criteria is necessary to substantiate health claims. The safety and traceability of ingredients in functional foods is critical for developing quality food products and establishing peace of mind in today's purchasing public.

Food based agriculture and processing companies can both benefit from functional ingredient innovation, enabling them to deliver quality and differentiated products to the marketplace.

The health benefits of functional foods for the consumer is the subject of media and scientific speculation, and the regulatory environment is not well defined but the price premium which such products command must be appreciated by agriculture and used to attain more value-added in marketing food and milk products.

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