

F R O S T & S U L L I V A N

50 Years of Growth, Innovation and Leadership

Global Nutraceutical Industry: Investing in Healthy Living

Healthy
Living



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PRELUDE

Globally, nutraceuticals are gaining prominence and becoming a part of the average consumer's daily diet. The key reasons for this have been the increased incidence of lifestyle diseases the world over, increase in life expectancy and inadequate nutrition due to the current lifestyle choices people make today. In fact, in developing nations, mortality due to nutrition related factors is nearly 40 percent, underscoring the need for nutraceutical products, to balance the nutritional intake of the individual.

"Global Nutraceutical Industry: Investing in Healthy Living" is a joint initiative between Frost & Sullivan and FICCI, to understand the current global scenario of the nutraceutical industry, laying specific focus on the European, US and Indian markets. These geographies have been selected due to the following factors:

- Europe: The European region encompasses some of the biggest names in the global nutraceutical industry, both in terms of product manufacturers and ingredient manufacturers. Further the European focus has been on innovation and new product development, and is thereby considered vital to the global nutraceutical industry.
- US: The US nutraceutical market is by far the most advanced in terms of product offerings and market penetration. A study of this market allows us an insight into how the nutraceutical industry has matured over the last decade. Moreover, the US has one of the highest scores in terms of consumer acceptability, making it crucial to study for manufacturers in developing markets.
- India: While the Indian industry is currently nascent, it has great potential and is expected to grow at a growth rate of 16 percent year on year for the next five years. This makes it one of the key markets for entry for nutraceutical product and ingredient manufacturers.

The objective of this study was to:

- Understand the market size, growth rates and drivers & restraints in each of the key regions globally
- Study the key ingredients per region along with the consumer need or want for nutraceuticals
- Understand the various forms of customisation that takes place in the nutraceutical space to suit the customer and also to capture how it differs as per region.
- Capture the various trends and developments in each of these geographies, and
- Broadly identify opportunities for growth across the value chain.

Further, we hope, this study arms you, the nutraceutical product and ingredient manufacturers, with key data and insights, to help you tackle the challenges of a nascent Indian industry and help build it into one of the key markets, globally, in the nutraceutical space.

We invite you to delve into and invest in the Indian Nutraceutical Industry, which is currently at a crossroads, poised to grow at a phenomenal rate over the next five years.

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EXECUTIVE SUMMARY

Introduction

With the increase in life expectancy and subsequent increase in lifestyle diseases, nutraceuticals have emerged as a necessity for consumers, especially in developed markets like the US. Nutraceuticals are often defined as any food or part thereof which provides health benefits including prevention or treatment of disease. This definition has now broadened to include functional ingredients such as vitamins, minerals, amino acids, fatty acids and probiotics etc.

In 2010, the global nutraceutical market experienced a surge in growth, especially post the recession. The high cost of healthcare and the after effects of recession, especially in the developed world, drove consumers towards dietary supplements and functional food and beverages, in a bid to remain healthy and avoid treatment costs.

Scope

This market insight covers the global market for nutraceuticals, with specific focus on US, Europe and India and the top ingredients in those countries. This service provides an array for information including market size, expected growth rates, market drivers and restraints as well as other trends and developments in the market.

To begin with, the nutraceutical market is segmented into the following

- Functional Food and Beverages
- Dietary supplements

The study discusses the definition and applications of various nutraceutical segments. Thereafter, the study describes the in-depth activities and market dynamics of each regional market.

Research Methodology:

The research methodology used by Frost & Sullivan is a combination of secondary desk research and primary interviews with participants in the market's value chain. The Primary research involved conducting extensive qualitative and quantitative interviews and discussions with Government officials, industry representatives, academicians, researchers and so on. It is likely to be worthwhile to note that detailed analyses have been carried out and conclusions reached on an overall basis. The research service is guided by rigorous analysis and judgment of experienced analysts.

Key research findings

The US Market

- ↔ In 2010, the US nutraceutical market stood at US \$ 50.4 Billion and was by far the largest nutraceutical market in the world
- ↔ Fast approaching maturity in the dietary supplements segment, while functional food and beverages are quickly catching up
- ↔ The dietary supplements segment was growing at roughly 3.1 percent while the functional food and beverages segment was growing at 5.6 percent
- ↔ US Consumers are extremely health conscious and demand specific ingredients in the nutraceutical products they consume, resulting in a need for customization of nutraceuticals for each target group.
- ↔ Currently, companies in the US are looking to diversify their products and are leaning more and more towards natural nutraceutical ingredients in their product offering, mainly due to the increasing consumer demand for all-natural, non-modified functional ingredients.

The European Market

- ↔ The total European Nutraceutical industry was valued at US \$ 35 Billion in 2010.
- ↔ The market for nutraceuticals in Europe is witnessing heavy consolidation, with DSM's acquisition of Martek Biosciences and Dupont's acquisition of Danisco being the most recent.
- ↔ Europe's focus within the nutraceutical industry is on innovation and new product development, resulting in increasing R&D spends in the sector, up from 0.24 percent of the industry revenue in 2004 to between 0.8 to 1 percent in 2010.
- ↔ Companies in Europe believe that product and ingredient innovation is the way forward for the nutraceutical industry. Germany, Netherlands and Sweden have emerged as the key nutraceutical innovation hubs in Europe, while Great Britain and Spain have emerged as key test markets for new products.

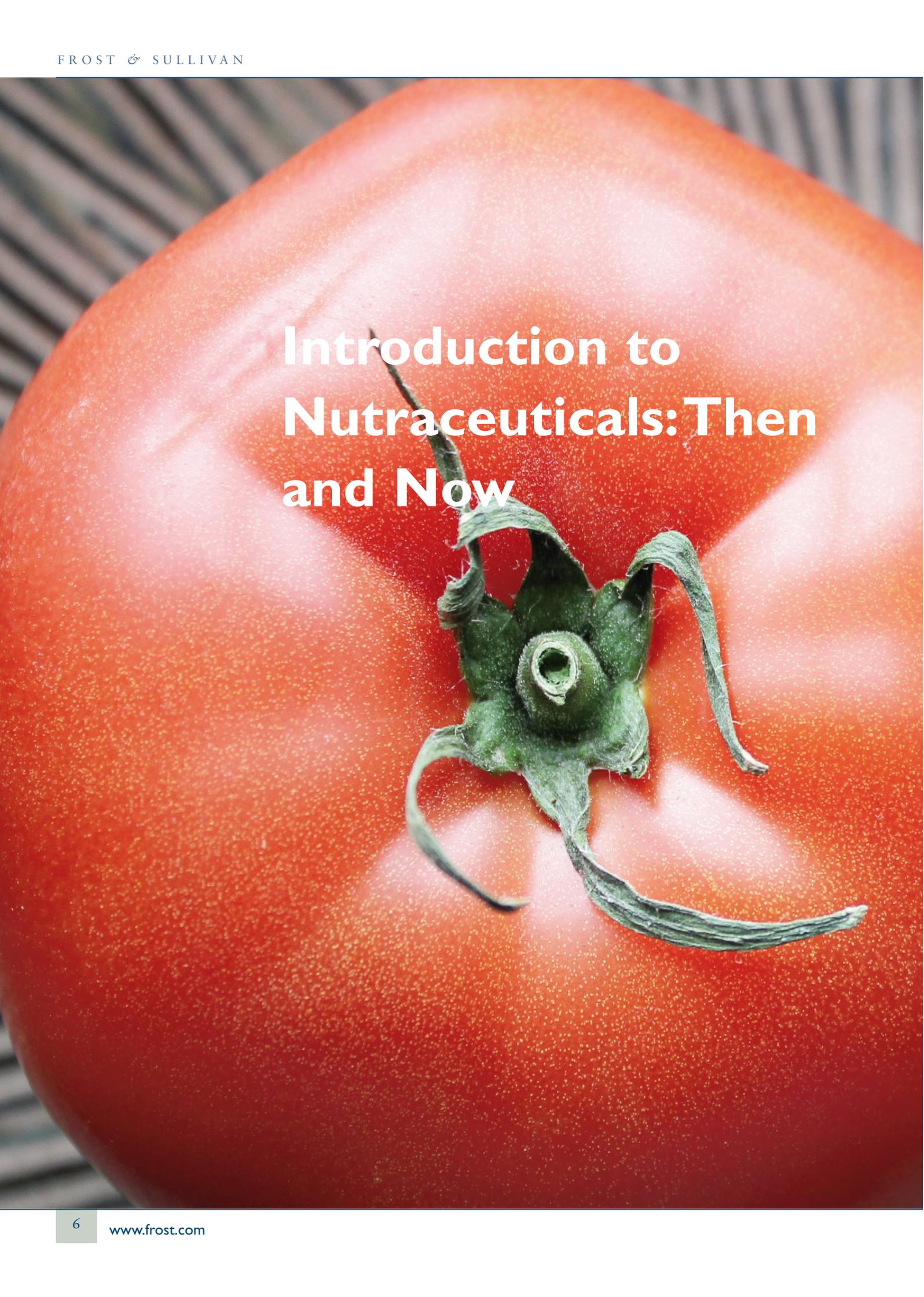
The Indian Market

- ↔ In 2010, the Indian Nutraceutical industry was estimated at US \$ 2 Billion, roughly 1.5 percent of the global nutraceutical industry.
- ↔ Currently a nascent market trying to incorporate traditional herbal ingredients (usually ayurvedic) into the nutraceutical portfolio. Key example is the chyawanprash supplements market in India, which stood at US \$74.5 Million in 2010.
- ↔ The existence of alternative medicine in India, and the Indian consumer's belief in them, could provide a platform for the nutraceutical industry to capitalize on.
- ↔ The Indian consumer's awareness about conventional nutraceutical ingredients such as omega-3 fatty acids or lutein is severely limited, and nutraceutical manufacturers need to take up the cause and spread awareness about their products to the Indian masses.

Global Ingredient Customisation

- ↔ Shift towards natural ingredients.
- ↔ Cultural customization to suit specific regions and specific target groups
- ↔ Shift towards new delivery mechanisms
- ↔ Disease/Condition specific formulations

Globally the nutraceutical market was estimated to be US\$ 140.1 billion in 2010. Of this USA and Europe formed the largest markets accounting to 36 percent and 25 percent respectively.



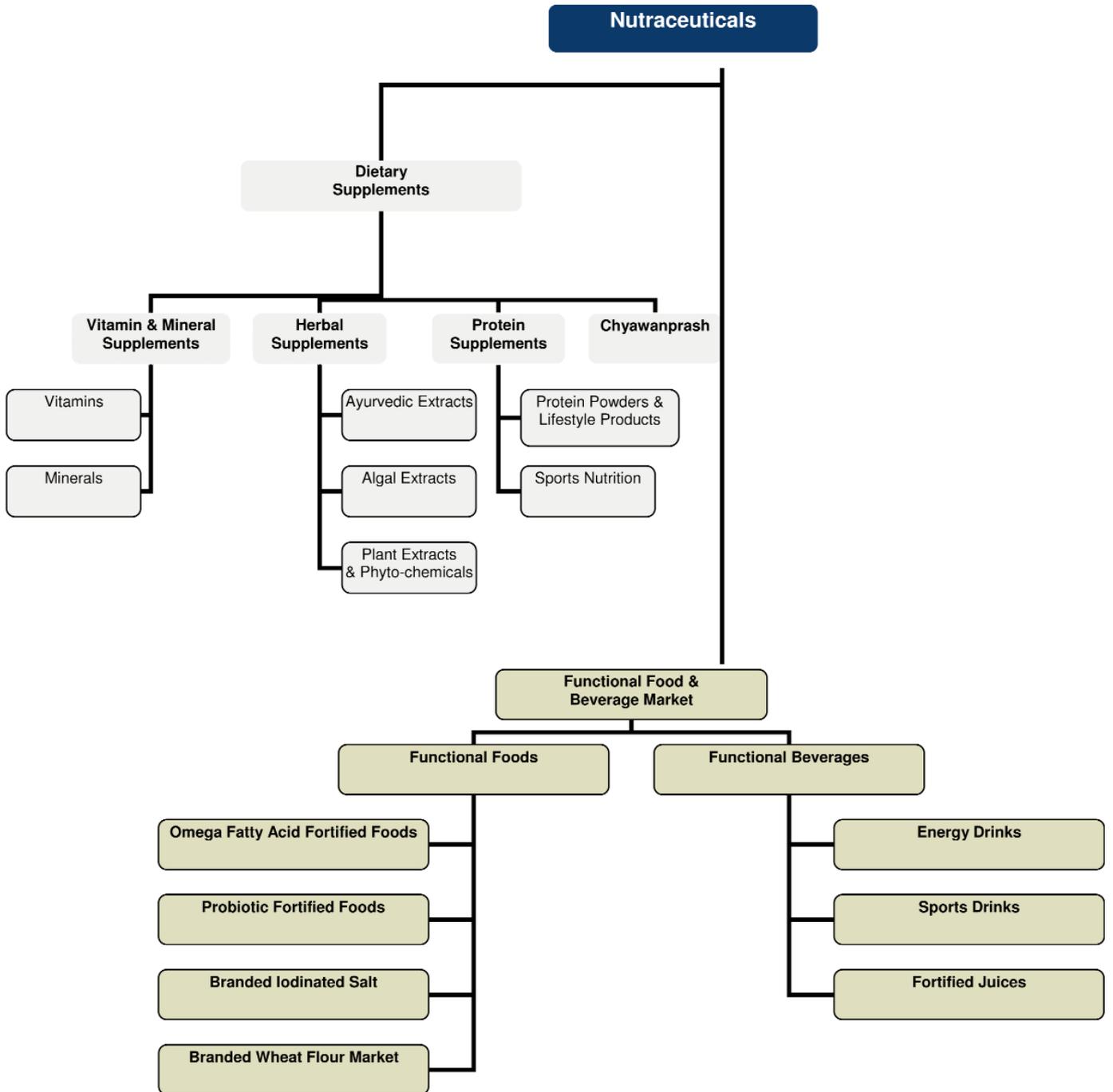
Introduction to Nutraceuticals: Then and Now

Nutraceuticals are products that provide health and medicinal benefits, including the prevention and treatment of diseases in addition to the basic nutritional value found in foodstuff. Nutraceuticals are particularly of interest to the present generation because they have the potential to substantially reduce the expensive, high-tech, disease treatment approaches presently being employed in Western healthcare. Primarily used in functional foods and dietary supplements, nutraceutical ingredients are natural bioactive, chemical compounds that have health promoting, disease preventing or medicinal properties.

Since the early 1990s, there has been a considerable shift in consumers' (especially consumers from developed countries) perspective toward nutraceuticals and functional foods. Currently, consumers are much more conscious and aware about health and many share the perception that the onset of many chronic diseases can be prevented with the proper intake of nutritious diet. Food supplements are not only being consumed for just meeting the recommended dietary allowance but also as a mechanism for performance enhancement and disease prevention.

In addition to the above-mentioned changes, consumers' preference has now undergone a paradigm shift from synthetic ingredients toward natural and organic foods, beverages and supplements. Present day's consumers are more informed, and this could be attributed to current day media, which keeps consumers abreast of the latest scientific developments in health and wellness. Consumers are now moving towards food products that are obtained from natural non-GMO (genetically modified organism) extracts.

Although the term nutraceuticals is in vogue, there is no universally accepted definition of the term. Broadly put, nutraceuticals can be defined as foods or food-derived substances in extracted form, which claim to provide medicinal and health benefits. In fact, the term is so broad that functional foods/beverages, dietary supplements, and any other type of food that provides health benefits fit into the nutraceutical category. However, the term becomes too broad and needs to be differentiated. Thus, for the purpose of this report, the term nutraceutical is restricted to functional foods and beverages and dietary supplements.



Varying Definitions and Regulations for Nutraceuticals around the world

Functional Food and Beverages	Dietary Supplements
<p>Functional foods and beverages are similar in appearance to, or may be a conventional food and beverages that are consumed as part of the usual diet, and is demonstrated to have physiological benefits and/or reduce the risk of chronic disease beyond basic nutritional functions. These products help prevent a disease or compromised health condition and/or improve physical or mental performance.</p>	<p>Dietary Supplements are defined as any product that can be taken by mouth that contains a dietary ingredient intended to supplement a diet. Dietary ingredients in these products may include vitamins, minerals, herbs, or other botanicals, amino acids, and substances such as enzymes, organ tissues, glandulars, and metabolites.</p>

Varying Definitions and Regulations for Nutraceuticals around the world

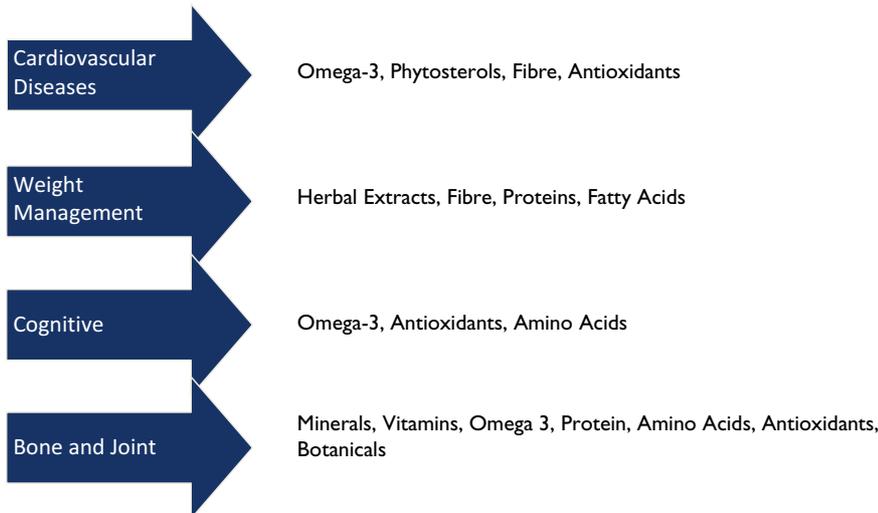
Country	Given Label	Definition	Regulating Body
United States of America	Dietary Supplements	<p>Any of the following which have a beneficial nutritional effect</p> <ul style="list-style-type: none"> • Vitamins • Minerals • Botanicals and their extracts • Amino Acids • Concentrates and Extract 	Food and Drug Authority
European Union	Food Supplements	<ul style="list-style-type: none"> • Concentrated Sources of Nutrients • Other substances with a beneficial nutritional effect 	European Food Safety Authority
India	Foods for special dietary use	<ul style="list-style-type: none"> • Plants/botanicals: Whole or extracts • Minerals, Vitamins, Amino Acids, Enzymes • Substances of animal origin 	Food Safety and Standards Act
Japan	Foods for Specific Health Use	<p>Any food that can provide and/or supplement any of the following</p> <ul style="list-style-type: none"> • Nutrition • Sensory Satisfaction • Beneficial Physiological Effect 	Japan Health and Nutrition Food Association
China	Health Foods	<p>Any food that</p> <ul style="list-style-type: none"> • should be suitable for specific group(s) of people • should also be able to adjust body functions and • should not aim at curing diseases or cause acute, sub acute or chronic harm to the body 	State Food and Drug Administration

Major Nutraceutical Ingredients

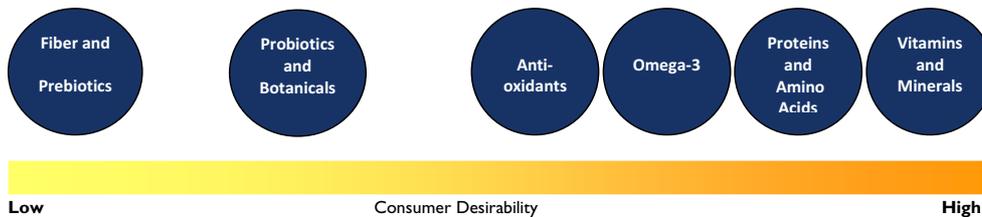
Vitamins	PUFA/ specialty lipids	Phyto- Chemicals	Prebiotics	Minerals	Amino acids, peptides proteins	Fibers
<ul style="list-style-type: none"> • Vit. C • B1, B2, B6, B12 • Folic acid • Niacin • Biotin • Panthothenic acid • Vit. A • Vit. E • Vit. K • Vit. D • β-Carotene 	<ul style="list-style-type: none"> • DHA/EPA • ARA • GLA • CLA • Structured lipids 	<ul style="list-style-type: none"> • Phytosterols • Isoflavones • Lignans • Polyphenols (from berries, olive, tea, tomato, apple, grape, cocoa) • Tocotrienols • Isothiocyanates 	<ul style="list-style-type: none"> • FOS • Inulin • GOS • Poly-dextrose • Other oligo-saccharides (XOS, SOS) 	<ul style="list-style-type: none"> • Calcium • Magnesium • Zinc • Iron • Sodium • Potassium • Selenium 	<ul style="list-style-type: none"> • Arg, Glu, Lys • Leu, Ile, Val • Lactoferrin • Immuno-globulins • Bioactive peptides • Digestive enzymes 	<ul style="list-style-type: none"> • Inulin • Poly-dextrose • Beta-glucan • Resistant starch • Gums such as guar gum • Pectins • Resistant maltodextrin • Psyllium • Insoluble fibres
Carotenoids	Polyols	Probiotics	Others			
<ul style="list-style-type: none"> • β-Carotene • Lycopene • Lutein • Zeaxanthin • Astaxanthin 	<ul style="list-style-type: none"> • Xylitol • Lactitol • Isomalt • Maltitol 	<ul style="list-style-type: none"> • Lactobacilli • Bifidobacteria • Other cultures 	<ul style="list-style-type: none"> • CoQ10 • Glucosamin • Chondroitin • Lipoic acid • Inositol 			

Functional Ingredients Profile, (World), 2010

Nutraceutical ingredients like omega-3 fatty acids (e.g. DHA) can be targeted at heart health or general cognitive health based on the formulation and the presence of other nutraceutical ingredients. Usually, each formulation be it functional foods or dietary supplements are fortified with two or more supplements so as to bolster the health claim associated with it. Some of the key target areas for nutraceutical Ingredients are listed below.



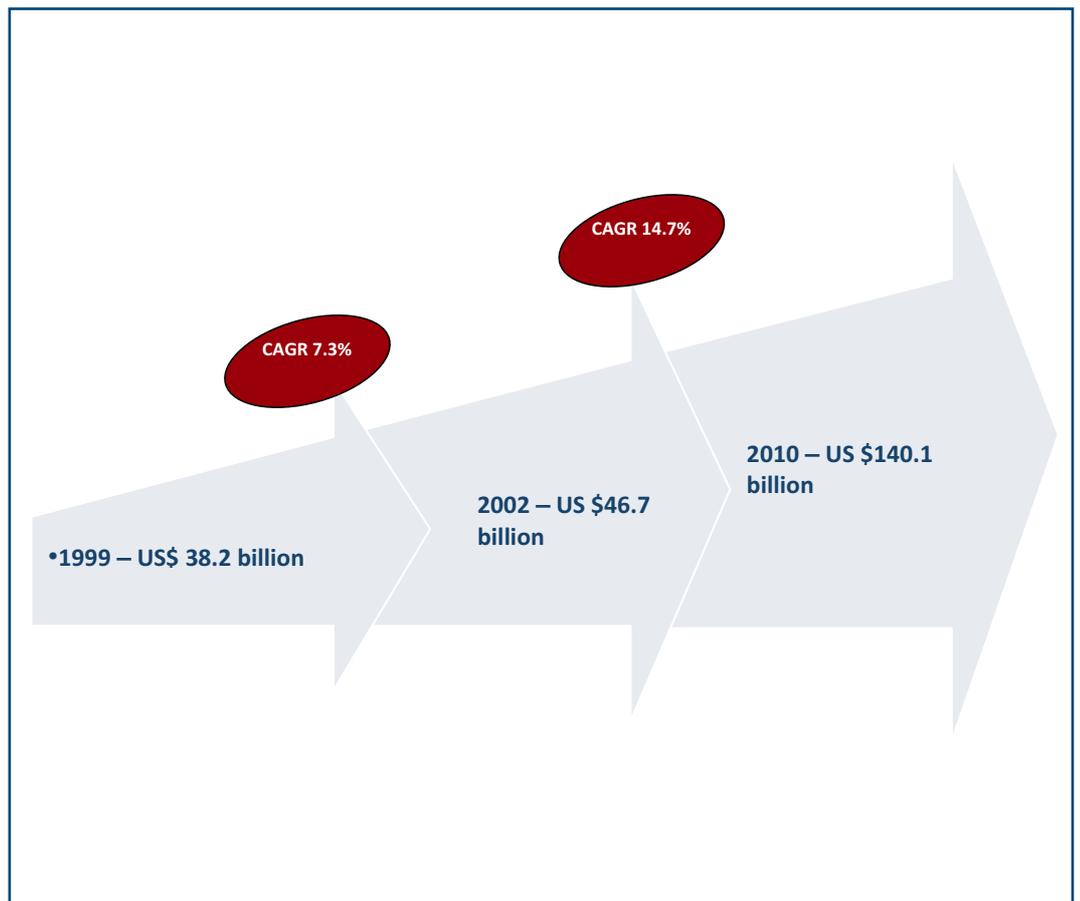
Consumer Desirability of Nutraceutical Ingredients, (World), 2010



These ingredients score high on health claims, positioning, research and application profile, consumer awareness, and current market size and growth rates.

GROWTH OF THE NUTRACEUTICAL MARKET: 1999 – 2010:

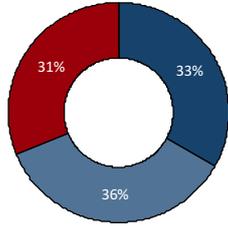
The global nutraceutical market has seen maximum growth in the last decade. While, nutraceuticals as an industry emerged in the early 1990s, 2002-2010 has been the key growth period for the industry. From 1999 to 2002, the nutraceutical industry grew at an Annual Average Growth Rate (AAGR) of 7.3 percent, while from 2002 to 2010, the AAGR doubled to 14.7 percent. The industry is expected to maintain comparable growth till 2015 driven by growth from India, China and Brazil





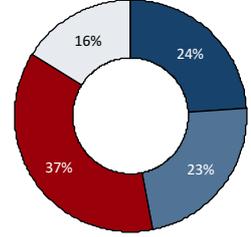
Global Nutraceutical Industry: Across Boundaries, Across Cultures

Nutraceutical Market: Split by Product Type, (World), 2010
Market Size: US \$140.1 Billion



■ Functional Food ■ Functional Beverage
 ■ Dietary Supplement

Nutraceutical Ingredients Market: Split by region (World), 2010
Market Size: US \$ 18.2 Billion

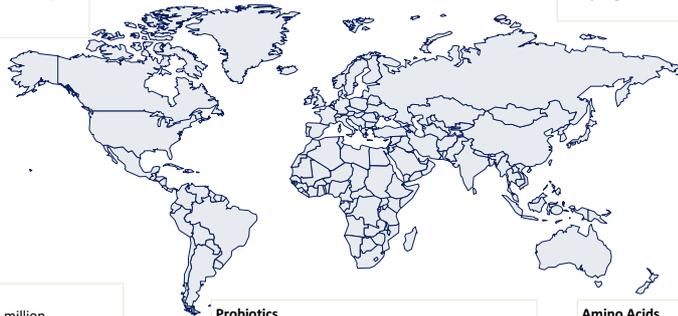


■ North America ■ Western Europe
 ■ Asia Pacific □ Rest of the World

Select Nutraceutical Ingredients Market, (World), 2010

Omega -3
 Revenue: \$1668.22 million
 Key Participants: Pronova Biopharma, ASA, ONC (Ocean Nutrition Canada), Martek Biosciences (Royal DSM N.V.), G C Reibel, EPAX

Vitamin E
 Revenue: \$83.4 million
 Key Participants: Royal DSM N.V., BASF AG, Adisseo S.A.S, Shenjiang Medical, Shenjiang NHU



Soy Proteins
 Revenue: \$3572.4 million
 Key Participants: Solae LLC, ADM Inc., Cargill Inc. and Roquette Freres

Probiotics
 Revenue: \$163 million
 Key Participants: Danisco A/S, Chr Hansen, Yakult Honsha, Morinaga, and BioGaia

Amino Acids
 Revenue: \$2571.8 million
 Key Participants: ADM, BASF AG, Ajinomoto, Evonik, Kyowa Hakko

The Nutraceutical Value Chain: Key Global Ingredients

Raw Material	Ingredient	End Products	Health Claim
Fish Oil, Marine Algae (EU and US)	Omega -3 fatty acids (DHA)	Fortified foods like bread, eggs etc and dietary supplements	Cardiovascular (CVD) health and cognitive health
1. Trimethylhydroquinone (crude oil extract – available globally) 2. Vegetable Oil (usually Soy from India or Brazil to maintain Non-GMO status)	Vitamin E (α-tocopherol)	Dietary Supplements both single and multivitamin	CVD health, bone and joint health and cognitive health
Ammonia or Ammonium Salts (treatment with various chemicals to obtain the desired acid – raw materials are available globally)	Amino Acids (lysine)	Fortified foods	Cognitive health
Mother cultures (available at company R&D Centers of government centers worldwide)	Probiotics (lactobacillus strains)	Fortified Foods and Dietary Supplements	Digestive health
Soy Bean (usually procured from India or Brazil to obtain Non-GMO raw materials)	Soy Proteins	Dietary Supplements	CVD Health and Weight Management

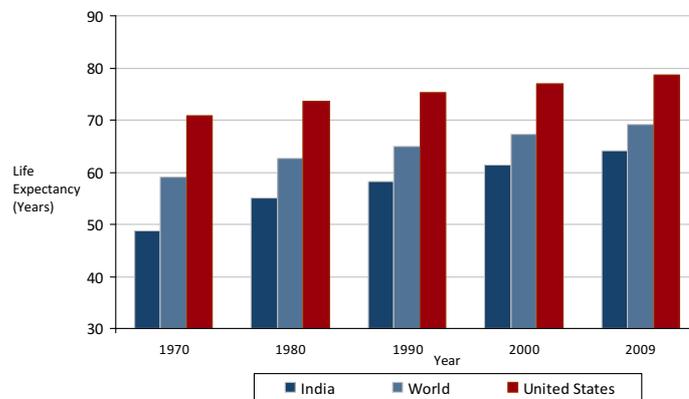
Developing nations such as India, China and Brazil have emerged as key sourcing destinations for agri-based raw materials, while Europe has evolved into a nutraceutical ingredient hub.

The need for nutraceuticals can be broadly attributed to increased life expectancy, Consumer awareness and health concerns and the high cost of healthcare, worldwide.

Need for Nutraceuticals

Increased life expectancy, globally, has led to an increase in the incidence of lifestyle (age related) diseases such as diabetes, high blood pressure and cholesterol, obesity etc. As a result, there has been a significant increase in the deaths due to lifestyle diseases worldwide. Consumers worldwide are looking to follow healthy lifestyles to obtain optimum nutrition to keep these diseases at bay, leading to an increase in nutraceutical consumption by health conscious consumers.

Life expectancy across regions, (World), 1970-2009

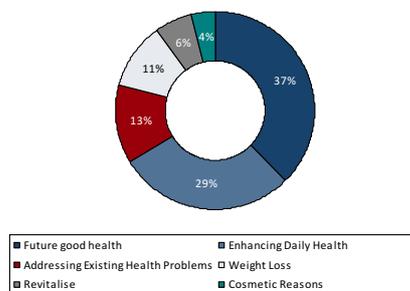


Source: World Bank Data and Frost & Sullivan Analysis

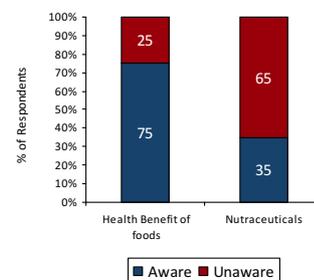
In spite of having a relatively lower life expectancy, India has one of the highest mortality rates for non-communicable, age related diseases. This trend can be witnessed across almost all developing countries

Consumer awareness and health concerns

Key Health Concerns, World, 2010



Consumer Awareness of Nutraceutical, World, 2010



While, most consumers are well aware of the health benefits of foods, only 35 percent were aware of the term nutraceuticals.

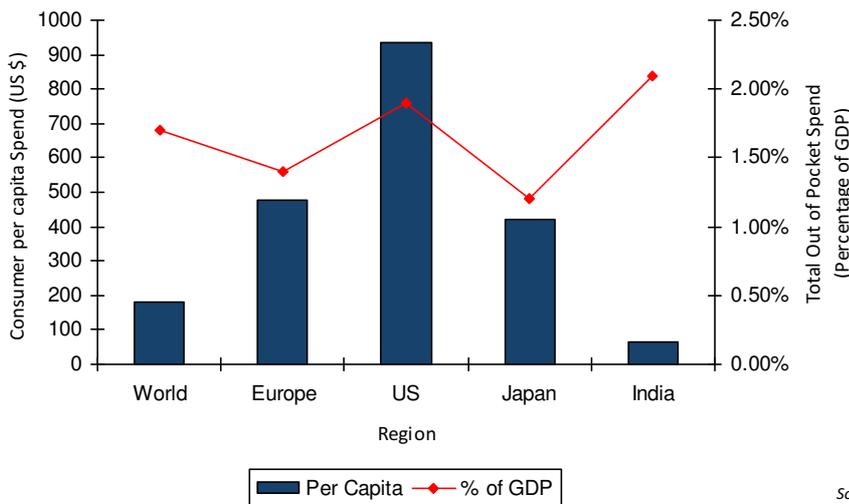
High Cost of Health Care

Cost of Drug Development, 2008

- Average Time: 12 to 15 years.
- Average Cost: \$500.0 million (2008 estimate)
- Only 5 in every 5,000 medicines reach the clinical trials stage and only one of those is approved for patient use.
- On average, only 3 in 10 prescription drugs meet or exceed average R&D costs. This ratio is even lower in developing countries.
- While the cost of developing drugs continues to increase, competition from generic drugs is tougher than ever.

Source: Frost & Sullivan Analysis

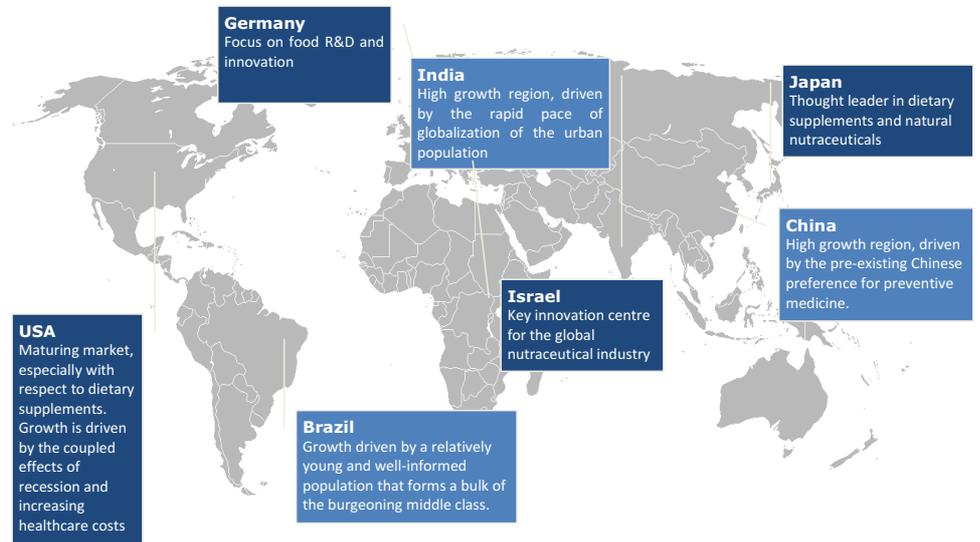
Consumer's Out of Pocket spend on healthcare: Comparative split by region, (World), 2008



Source: WHO Statistics

While India had one of the lowest per capita out of pocket healthcare spends of US \$63, the cumulative spend was roughly 2.10% of the GDP, one of the highest in the world reflecting the high impact on the consumer.

GLOBAL NUTRACEUTICALS: GLOBAL HOTSPOTS AND EMERGING GEOGRAPHIES



Spearheading Nations	Key Growth Geographies	Nutraceutical Future Focus
<ul style="list-style-type: none"> • United States of America • Japan • Israel • Germany 	<ul style="list-style-type: none"> • China • India • Brazil 	Application/Disease specific focus for both functional food and beverages as well dietary supplements

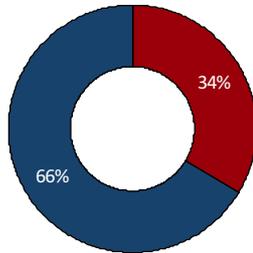
Source: Frost & Sullivan Analysis

Globally, US and Japan are the most developed markets for nutraceuticals, due to the consumer acceptability achieved in these regions. India, China and Brazil are developing nations which show huge potential for the nutraceuticals market. Germany and Israel have emerged as the key innovation hubs of the nutraceutical industry. In Israel, the industry is driven by ingredient companies such as Solbar Industries, LycoRed Natural Ingredients, Adumim Food Ingredients, Enzymotec, Algatechnologies and Frutarom etc. While the nutraceutical market in Israel is currently experiencing a period of growth, growing at 7 to 8 percent year on year, a bulk of the revenue from nutraceutical ingredients in Israel is from exports, usually to the EU, Eastern Europe and the US.

A pair of hands is shown from a low angle, cupping a small, vibrant green seedling with several leaves and a mound of dark soil. The background is a bright blue sky with soft, white clouds. The overall image conveys a sense of growth, care, and potential.

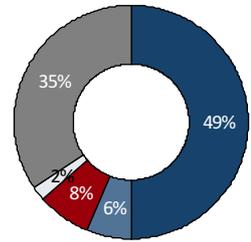
European Nutraceutical Market: Consumer Propelled Growth

Nutraceutical Market: Split by Product Share, (Europe), 2010
Market Size: US \$ 35 billion.



■ Functional Food & Beverages ■ Dietary Supplement

Nutraceutical Ingredients Market: Split by product Share, (Europe), 2010
Market Size: US \$ 4.1 billion



■ Vitamins and Minerals ■ Amino Acids
 ■ Omega-3 fatty acids ■ Probiotics
 ■ Others

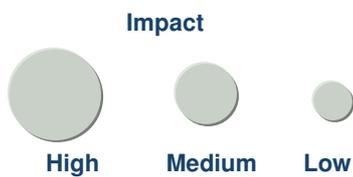
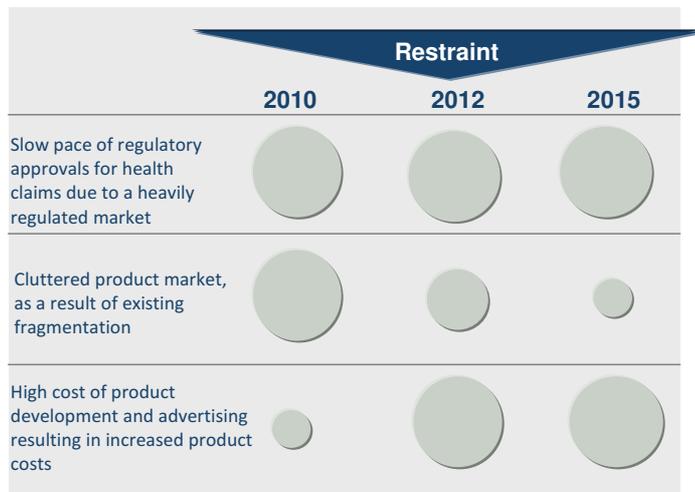
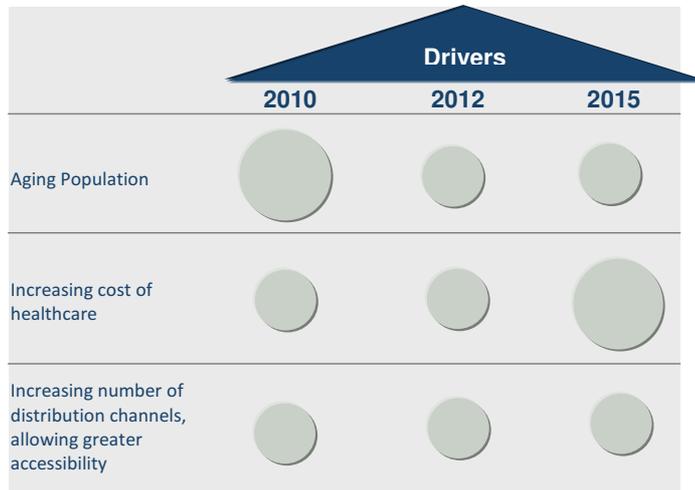
Select Nutraceutical Ingredients Market, (Europe), 2010



Key Market Drivers and Restraints

Nutraceuticals Market: Market Drivers and Restraints, (Europe), 2010 – 2015

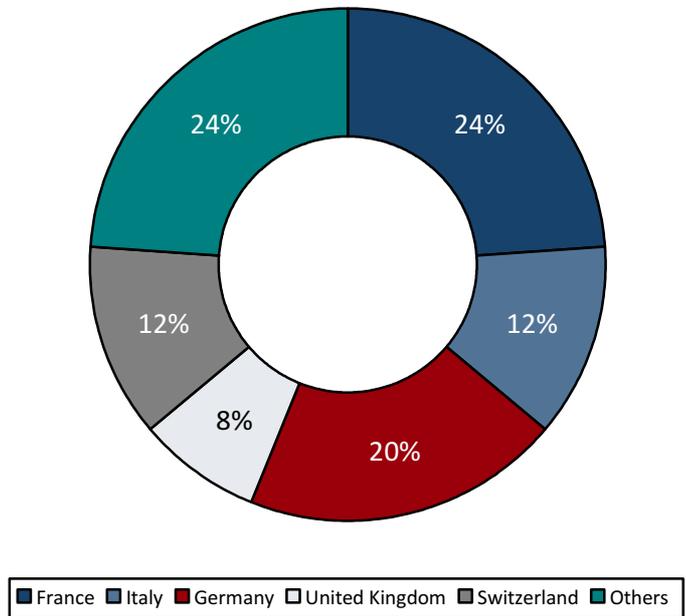
CAGR (2010-2015): 5.7%



Currently, product launches in the EU have slowed considerably due to the stricter EFSA guidelines and slow approval process.

Country-wise Markets:

Nutraceuticals Market: Split by Country, US \$35 billion, (Europe), 2010



Source: Frost & Sullivan Analysis

Germany, France and Italy are the key markets in this region, while UK and Spain have emerged as the key test markets, resulting in a high frequency of product launches.

Most Desirable claims

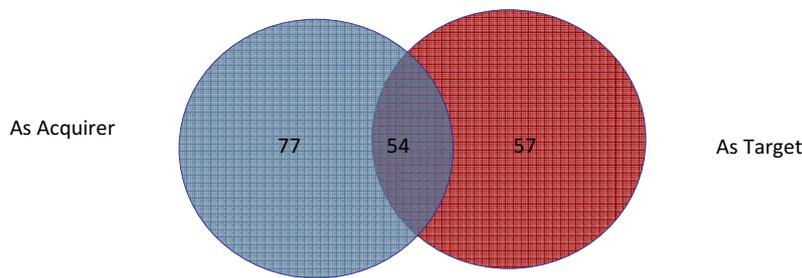
Germany	United Kingdom	France
<ol style="list-style-type: none"> 1. Boosts Immune System 2. Promotes Healthy Bones 3. Promotes Healthy Teeth 4. Gives Energy 5. Promotes Health Gut 	<ol style="list-style-type: none"> 1. Gives Energy 2. Promotes Healthy Bones 3. Promotes Healthy Teeth 4. Reduced Risk of Health Cancer 5. Lowers Cholesterol 	<ol style="list-style-type: none"> 1. Gives Energy 2. Lowers Cholesterol 3. Increases Disease Resistance 4. Boosts Immune System 5. Prevents Constipation

The nutraceuticals product market in Europe is driven on the basis of health claims.

Key Acquisitions

Between 2007 and 2010, 131 deals were struck resulting in the acquisition of European companies. Of this, 54 of the acquiring companies were European as well. Comparatively, European companies struck only 111 deals as the acquirer (including the 54 intra-european deals). However, this was by far the largest number of acquisitions carried out by companies from a single region for the same period. Of companies acquired overseas, the maximum number were carried out in the US (23 deals).

Food and Beverage Ingredients: Acquisitions involving European companies, 2007 -2010

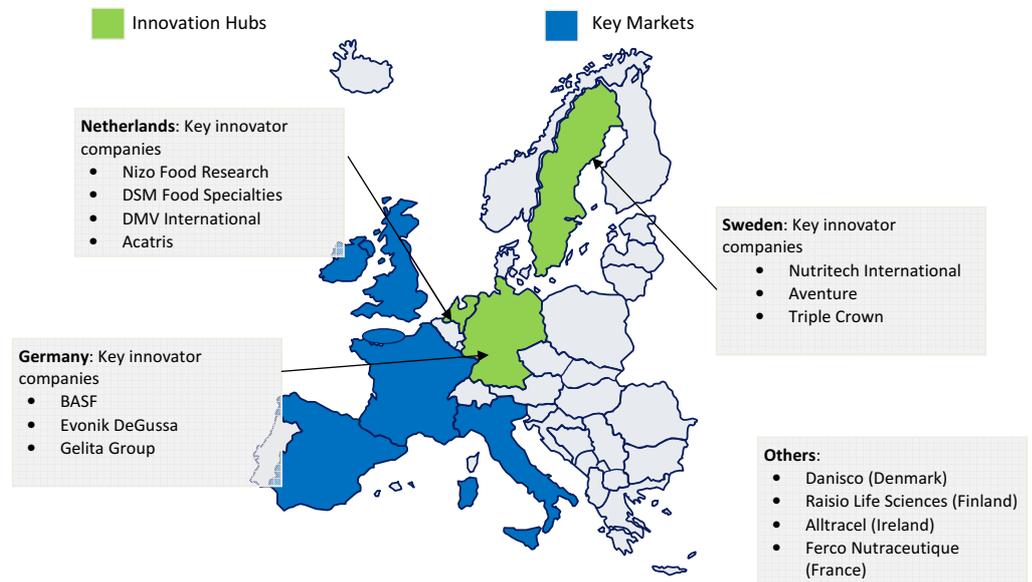


European food and beverage manufacturers are moving towards consolidation, resulting in a high number of acquisitions in the nutraceuticals space.

Key acquisitions in the last three years include DuPont's acquisition of Danisco and DSM's acquisition of Martek

Germany, Sweden and Netherlands form the key R&D and innovation centres in the European union, while Spain and UK form the major test markets for new products in the EU. Successful products are then expanded to other lucrative regions such as France and Italy.

Europe: Key markets and Innovation hubs



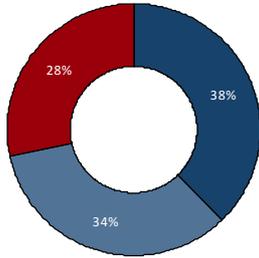
Europe Nutraceutical Market: Trends and Developments

- Fragmented Market - looking to consolidate in the near future
- Small and medium businesses rule the roost in this segment, resulting in lower advertising and marketing spends and thus limited expansion.
- Consumer demand is the key driving factor for the segment as they become more interested and aware about food content and nutrition.
- Growth in this region is usually on the basis of ingredients as opposed to the finished product. This can be seen in the greater product share of the dietary supplements segment, which is fast approaching maturity.
- A number of new functional food and beverages launched in the market, advertising mainly the lack of additives and preservatives. This is reflective of the European preference for natural products.

A close-up photograph of a young woman with dark hair pulled back, smiling warmly at the camera. She is wearing a white t-shirt and large hoop earrings. She is holding a red apple with both hands, which has a heart-shaped hole cut into its side, revealing the yellow flesh inside. The background is plain white.

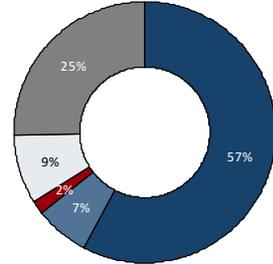
US Nutraceutical Market: Impelling Global Growth

Nutraceutical Market: Split by Product Share, (USA), 2010
Market Size: US \$ 50.4 billion



■ Dietary Supplements ■ Functional Foods ■ Functional Beverages

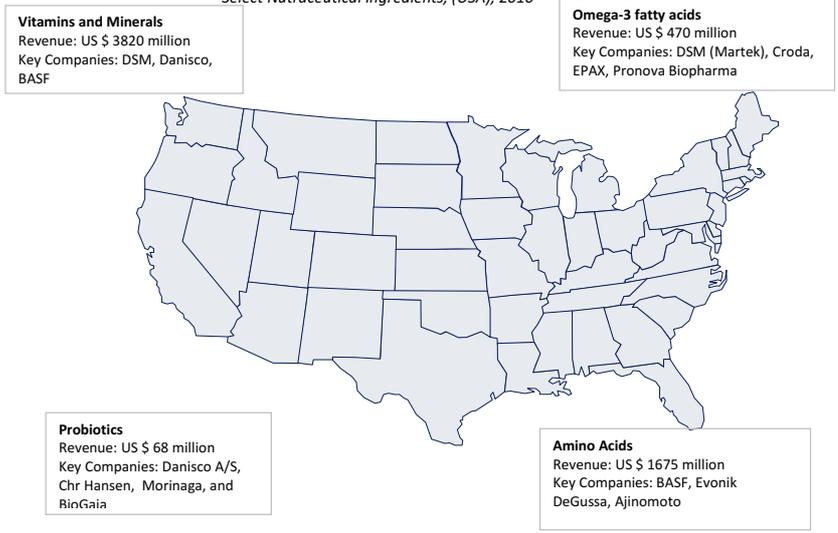
Nutraceutical Ingredient Market: Split by Product Share, (USA), 2010
Market Size: US \$ 6.7 billion



■ Vitamins and Minerals ■ Omega-3 Fatty Acids ■ Probiotics ■ Amino Acids ■ Others

Source: Frost & Sullivan analysis

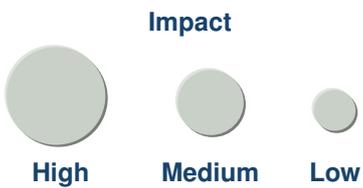
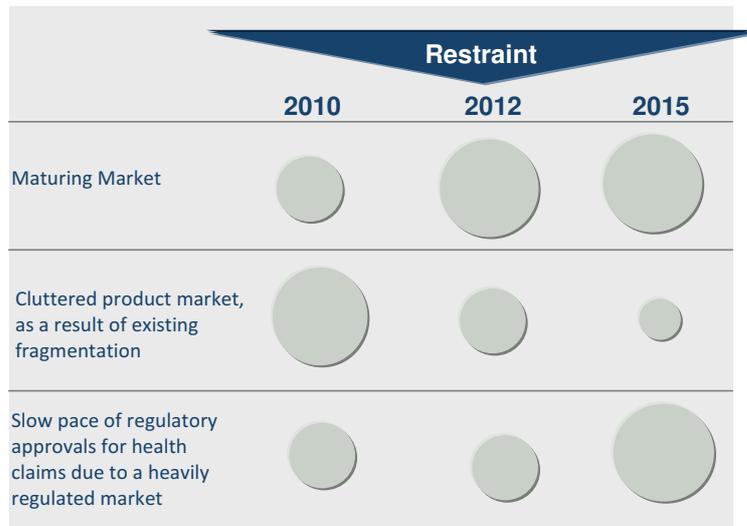
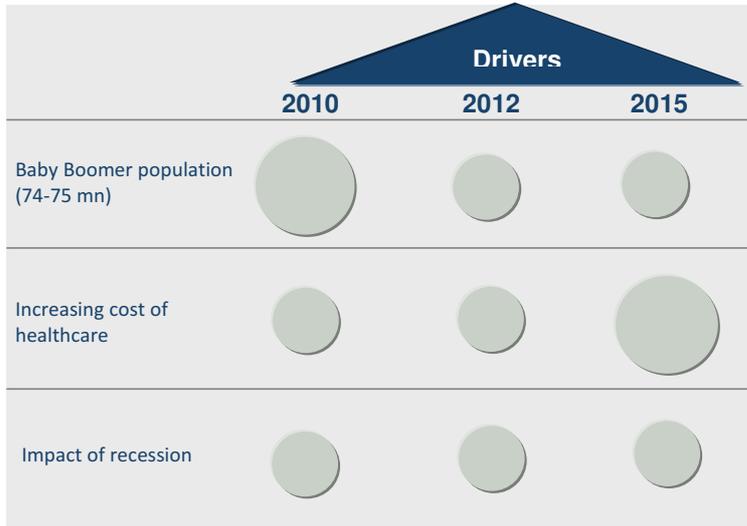
Select Nutraceutical Ingredients, (USA), 2010



Key Market Drivers and restraints for Nutraceutical Product:

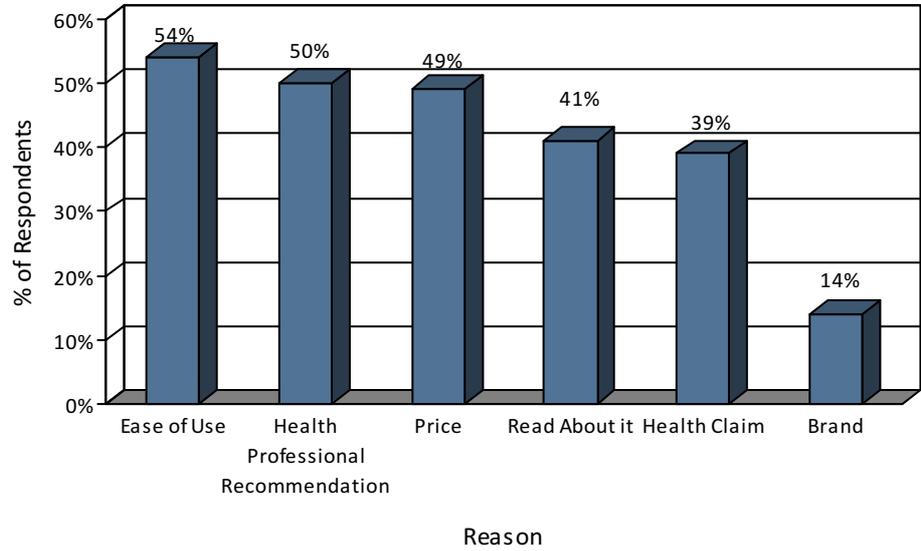
Market Drivers and Restraints, (US), 2010 – 2015

CAGR (2010-2015): 5.1%

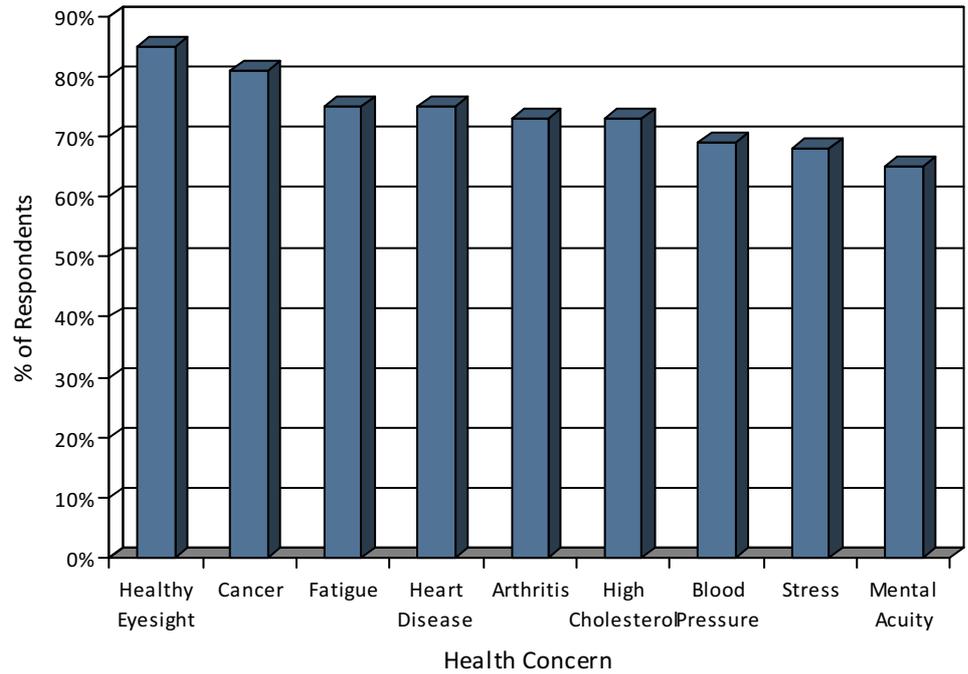


The United States nutraceutical market being the largest and closest to maturity can afford nutraceutical manufacturers an insight into consumer behavior.

Consumer Insight: Factors influencing purchase of nutraceuticals in the United States

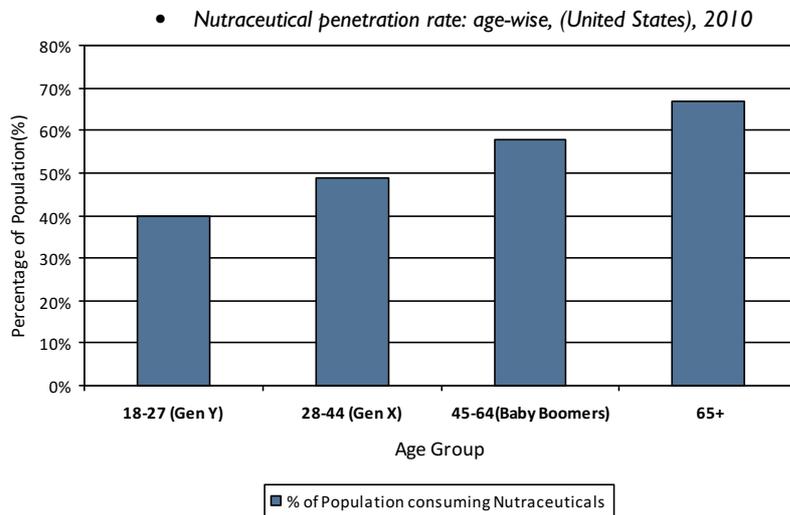


Consumer Insight: Key Health Concerns, US 2010



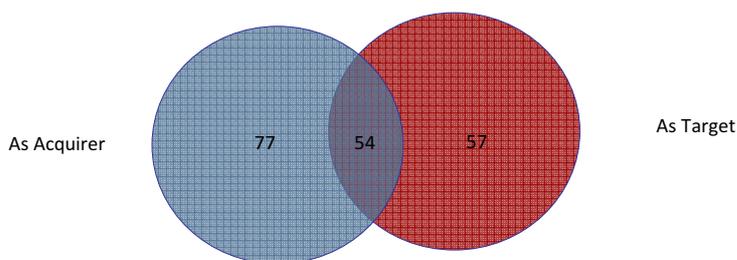
US Nutraceutical Market: Diversifying a mature market

The high penetration rate in the baby boomer segment, gives us an idea about the fast approaching maturity levels of dietary supplements. As a result, nutraceutical manufacturers are shifting focus to both Gen X and Gen Y, to help realize the potential of the US Nutraceutical market.



- High amount of consolidation in the food and beverage ingredients industry

Food and Beverage Ingredients: Acquisitions involving US companies, 2007 -2010



Between 2007 and 2010, there were 172 acquisitions involving US companies in the food and beverage ingredients sector, of which only 37 were domestic acquisitions. In total 96 US companies were acquired, while 78 US companies acquired other firms.

While dietary supplement manufacturer’s marketing focus has largely been on the baby boomer population, Gen X and Gen Y is the key focus for functional food and beverages.

The food ingredients market in general is undergoing a transformation from a highly fragmented market towards a consolidated one. This can be seen in the number of acquisitions involving US companies in the last 3 years.

A direct impact of the need for diversification in the US market can be observed in the recent product launches in the nutraceuticals space.

Key product launches in the US 2009 to 2011

Brand Name	Functional Ingredient	Company	Segment
Zone Perfect Nutrition Bars	10g of protein, 19 vitamins and minerals and antioxidants	Abbot Nutrition	Functional Foods
Kashi Waffles	Omega-3 and fibers	Kashi Company	Functional Foods
ResLina	Reservetrol	Nutrition Earth	Dietary Supplements
CaféFit Dieting Blend Coffee	Garcinia cambogia extract and vitamins and minerals	CaféFit	Functional Beverages
Tropical Tangerine	D-Ribose	Assure Food & Beverage Company	Functional Beverages
Kiwi Strawberry Melon	Omega-3	Assure Food & Beverage Company	Functional Beverage

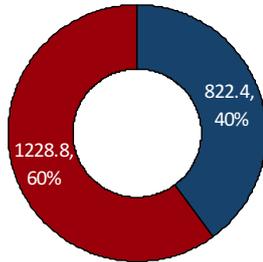
- A majority of the launches have been in the functional food and beverages space, compared to dietary supplements.
- The collective health claims of the above listed products range from improved energy to improved cognizance and heart health which are typically targeted at the Gen X population.
- Probiotics and Omega-3 fatty acids are the convention nutraceutical ingredients that promise maximum growth over the next five years.
- The shift in consumer preference towards natural variants of functional ingredients; one can expect to see a drop in the market share of the vitamins and minerals segment and an increase in the ‘others’ segment.

In conclusion, the US market is moving towards consolidation, while simultaneously diversifying their offering in terms of products and target markets.



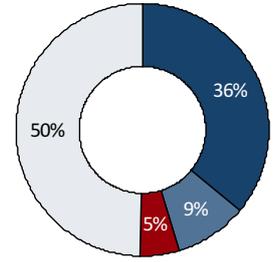
Indian Nutraceutical Market: Growing Downstream

Nutraceutical Market: Split by Product Share, (India), 2010
Market Size: US \$2.0 billion



■ Dietary Supplements ■ Functional Food and Beverages

Nutraceutical Ingredient Market: Split by Product Share, (India), 2010
Market Size: US \$250 million



■ Vitamins & Minerals ■ Probiotics
■ Omega-3 fatty acids □ Others

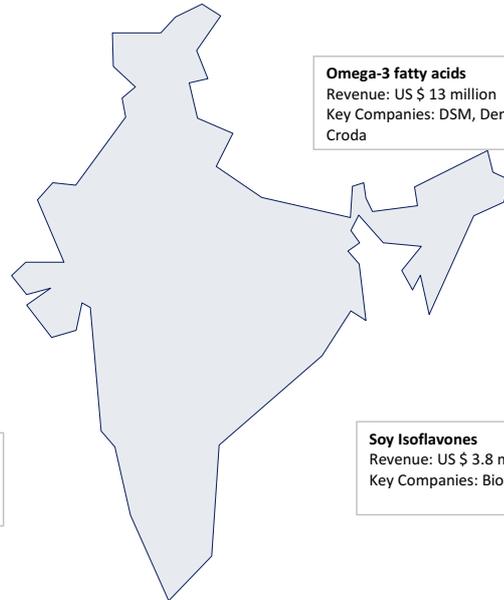
Select Nutraceutical Ingredient Market (India), 2010

Vitamins and Minerals
Revenue: US \$ 90 million
Key Companies: DSM, BASF, Merck

Omega-3 fatty acids
Revenue: US \$ 13 million
Key Companies: DSM, Denomega, Croda

Probiotics
Revenue: US \$ 23 million
Key Companies: Chr. Hansen, Danisco,

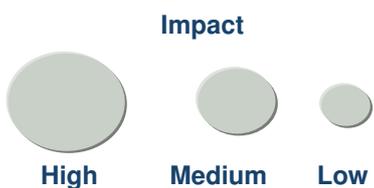
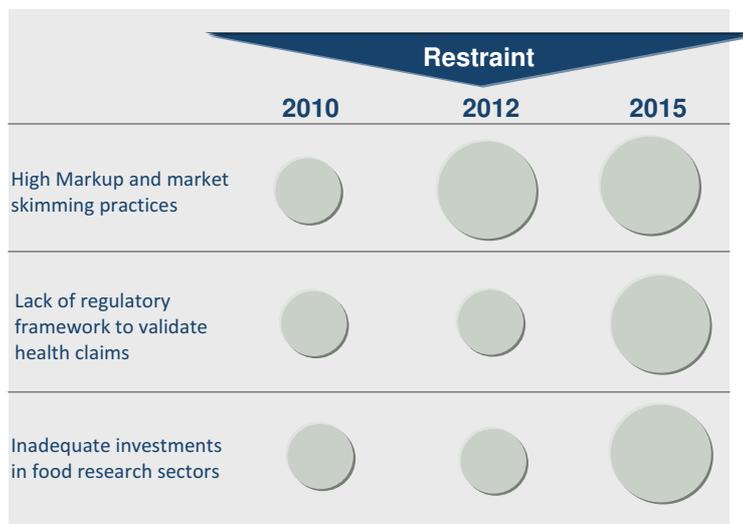
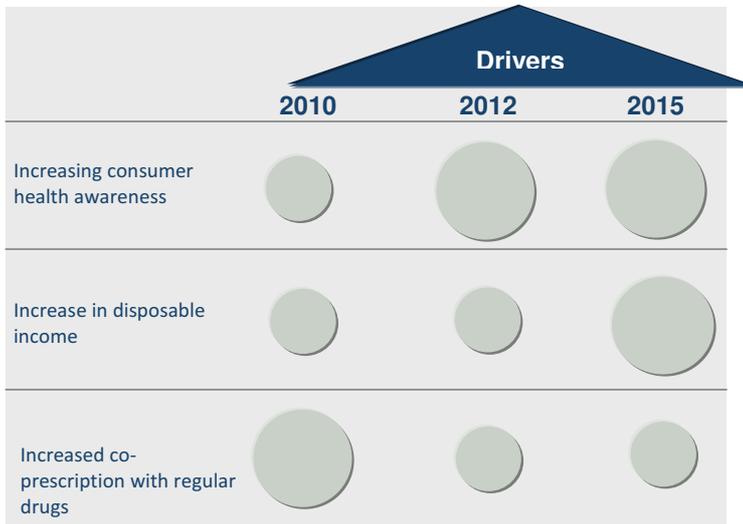
Soy Isoflavones
Revenue: US \$ 3.8 million
Key Companies: Bio-gen Extracts



Key Drivers and Restraints for Nutraceutical Products:

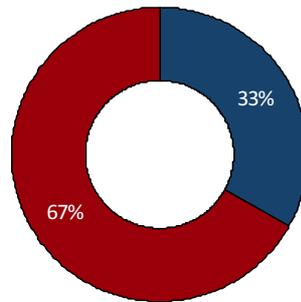
Market Drivers & Restraints, (India), 2010 -2015

CAGR (2010-2015): 16.0%



Indian Nutraceutical Market – Moving to the market’s next generation

In India, functional foods are expected to see increased consumption over the next five years resulting in functional foods and beverages garnering greater product share in the market as opposed to dietary supplements. The total Indian nutraceuticals market in 2015 is expected to be roughly US \$ 5 billion



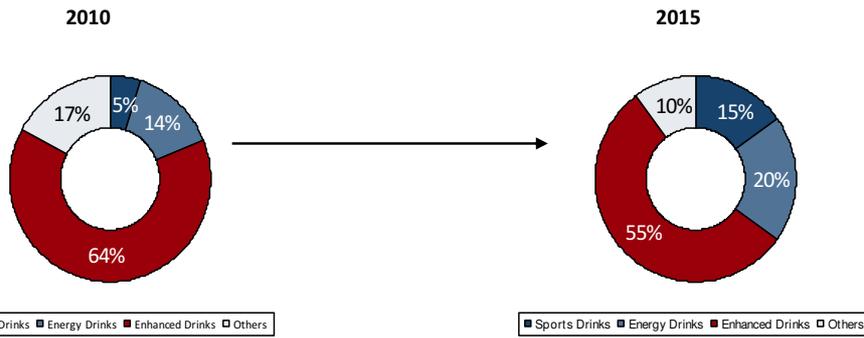
■ Dietary Supplements ■ Functional Food and Beverages

Source: Frost & Sullivan Analysis

Functional food and beverages are expected to witness much higher growth rates when compared to dietary supplements over the next five years.

In each product segment, manufacturers can expect a minor shift in consumption, driven by the demand for new and improved product as well their health claims.

Interestingly, in the Indian market, the consumption of alternative herbal medicines and supplements (usually ayurvedic and homeopathic) is expected to have a detrimental effect on the nutraceutical market and is considered as a loss to the unorganized market by manufacturers. This segment promises huge potential to nutraceutical product manufacturers, through customization of their products to include natural and herbal ingredients. The success of the chyawanprash supplement market being case in point.



Functional Beverages Product Share Shift, India, 2010-2015



Functional Foods Product Share Shift, India, 2010-2015



Dietary Supplements Product Share Shift, India, 2010-2015

Functional beverages - increase in uptake of enhanced drinks and energy drinks primarily driven by a young urban working population.

Functional foods - diabetic foods are expected to see the highest growth, as consumers tend to perceive a healthy diabetic lifestyle as an alternative to insulin.

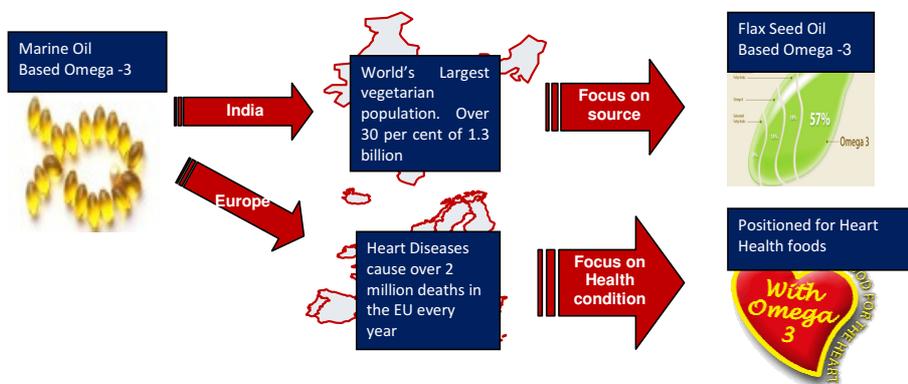
Dietary supplements - vitamin and mineral supplements continue to hold a majority share of the market.



CUSTOMISING NUTRACEUTICALS

The Nutraceutical industry is both a brain child and product of the need for preventative personalised medicine. Born of consumer demand for better food the Industry continues to use consumers for inspiration. Nutraceutical's have moved from healthy diet additions to mandatory diet requirements specifically designed to consumer requirements. As such it is an industry that constantly tracks and monitors consumer trends and its products are often direct responses to such demand. Below is a list of key trends and their resulting product developments:

1. Natural Trend: With increasing concerns about chemical side effects and introduction of synthetic additives into foods consumer demand for natural alternatives increased dramatically. The industry responded to such demand by focusing on customisation of products to focus on natural alternatives for established variants. For instance, growing concerns about the fears of aspartame a popular sweetener till its role as a possible carcinogen was made known led to the introduction of stevia, a natural sugar alternative and plant extract. This trend towards natural products has taken the West by storm with consumers equating natural to healthy. Natural variants are today one of the most sought after avenues in the nutraceutical segment. This is apparent by the increasing demand for natural antioxidants both in foods and supplements. Popular orange drinks such as Fanta and Sunny D are facing increasing competition from variants filled with natural beta-carotene antioxidants from algae and vegetables in spite of these products being more expensive.

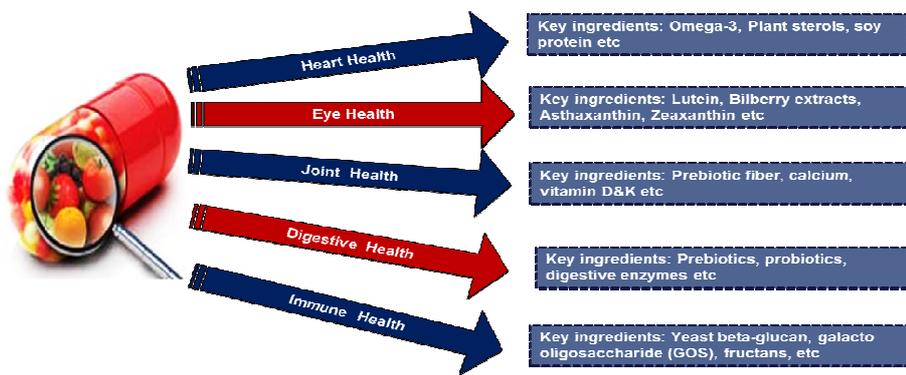


2. Cultural Customisation: Nutraceutical manufacturers understand that various cultures have specific requirements for products. The latest trend is towards ascertaining such cultural requirements and focusing on these. For instance in India omega-3 a traditionally non-vegetarian product has been developed with vegetarian variants obtained from algae and flaxseed oil. In contrast in the West particularly Europe, a highly aware market, the focus for omega-3 products is specific health functions particularly heart health, a primary cause of European deaths. India is a key market that has brought forward the importance of understanding a country's cultural psyche before launching products. For instance the probiotic industry in India has faced challenges of a completely varied kind than seen elsewhere in the world. This is primarily because yoghurt the primary mode of intake of probiotics is an essential part of the indigenous diet and

normally home-made. Convincing consumers to pay premium for something so easily available has been a major stumbling block for marketers. As nutraceutical markets move east it is necessary for manufacturers to understand the importance of culture while marketing products. This is especially important in India and China where traditional medicine and home-made remedies still hold immense sway on the average population. China, for example, has been witness to new products that are possibly unknown in other parts of the world. These include mood enhancing drinks such as Scream and gender specific drinks such as He & She both native to the Chinese market alone.



3. Innovative Delivery Formats: Nutraceutical ingredients have typically been positioned as natural and healthy alternatives to traditional medicine. However one of the primary challenges being faced by these products is the difficulty in formulating these products into traditional food and beverage products. Consumers are also seeking more variety and benefits from delivery methods beyond those possible through traditional tablet and capsule technologies. Such challenges have caused for innovative product presentation to ensure ingredient viability and stability. Flavour masking has been one of the primary modes of supplying nutraceutical ingredients. With major flavour and fragrance companies such as Givaudan working on increasing technology to increase flavour masking the consumption of nutraceutical ingredients has also increased. The prime examples of such masking have been for those of omega-3 and soy products, both increasing dynamic markets that were being hindered by the unpleasant taste of the ingredients. Other such technologies include new formulations that increase stability of ingredients in the final product. For any food or supplement manufacturer looking to add functional ingredients to their products, the key issue of stability must be addressed as soon as possible during the product development process. Increasing technologies of microencapsulation, nano-separation and so on has allowed for extremely inventive new formats of delivery such as electrolyte delivering strips and vitamin enhanced chewing gum. Manufacturers have cashed in on popular snacks and fortified them thereby allowing for a new lease of life for both the nutraceutical as well as the convenience foods market.



4. Condition Marketing: With increasing sophistication among nutraceuticals and the demand for personalised medicine growing, consumer demand for products with specific health benefits has been skyrocketing. The rise of this trend popularly known as condition marketing has given rise to a whole new avenue of product differentiation. This is particularly apparent in Europe where nutraceutical products have now been cordoned into various segments based on the health benefits. These sectors such as heart health, eye health, digestive health, joint health and so on are gaining immense popularity with manufacturers positioning themselves to focus on certain health avenues specifically. Ingredients such as lutein, beta-carotene, asthaxanthin and various other carotenoids have been earmarked for eye health while the omega-3 and phytosterol segment focuses on heart health. With increasing incidences of life style related diseases customers are increasingly looking for preventive care along with their daily diets. For instance Calcium supplements are one of the largest supplement sectors in Asia due to the high risk of Asian women to osteoporosis. Manufacturers have focussed on positioning their products to focus on the most common non-chronic diseases in a particular region. For instance the major supplement categories in the USA are for heart health as opposed to Australia where primary interest is in Bone health. Also in the weight management category while Europe and USA focus on tackling obesity at an overall level the Asia Pacific regions are focusing on tackling the alarming rise of childhood obesity. The rise of nutraceuticals that are health benefit specific is a key area of customisation in the Nutraceutical arena.

Customisation in Europe, US and India

- **Europe:** In Europe, customisation trends have been targeted towards the inclusion of natural variants instead of the synthetically manufactured ones. The key challenge for most manufacturers has been meeting the regulatory demands of the EU, which results in slow approvals for most nutraceutical products. European companies are also focused on the health claims of the ingredients so as to garner maximum market penetration. The trend so far has been to look eastward, to India and China for the supply of these ingredients.
- **US:** In the US, the focus for nutraceutical manufacturers has been on innovative delivery mechanism to facilitate the use of nutraceuticals amongst its target groups. However, with European companies looking to the US as a takeover destination, the US market is expected to witness a gradual shift toward natural ingredients.
- **India:** Customisation in India, is currently not a prevalent trend, however is likely to pick up over the next few years. The potential for cultural customisation and inclusion of natural ingredients is high in the region, given the high acceptance of alternative herbal medicines. Moreover, India has emerged as a key sourcing destination for natural ingredients, thereby, allowing manufacturers easy access to their ingredients.

A person is seen from behind, standing on a grassy hill. They are wearing a dark blue or black hoodie and light-colored, possibly khaki, pants. The person is looking out over a vast, clear blue sky. The grass on the hill is a mix of green and yellow, suggesting it might be late summer or early autumn. The overall mood is contemplative and forward-looking.

Focusing on the Future

Nutraceutical manufactures have finally gauged that the one size fits all theory does not work in this market and products need to be customized to appeal to specific demographics within not only regional but also country-wise populations.

The market for nutraceutical products around the world is witnessing an identity shift in consumer awareness. These products are constantly being evaluated around the world as messiahs of prosperity in the trend towards preventative medicine. However with varying global outlooks and requirements the Nutraceutical industry has finally come of age in anticipating and understanding regional requirements.

Strategic Market Snapshot

Europe

Factor	Measure	Trend	Impact 2010-11	Impact 2012-15
Market Size (\$ bn.)	35	Increasing		
Growth Rate (FY '10-FY '15 CAGR)	5.7%	Stable		
Market Concentration	~20%	Increasing		
Technology Barrier	Medium-High	Decreasing		
Price Sensitivity	Medium	Stable		
Scope for Differentiation	Yes	Stable		

Key Feature: Health Claim Driven Highly Competitive Market to Enter

- ✓ Disease/ Benefit focus - making health claims and backing them up
- ✓ Consolidation to reduce the number of market participants and free the market from product clutter
- ✓ Increased focus on functional foods and beverages

Strong Impact
 Weak Impact

USA

Factor	Measure	Trend	Impact 2010-11	Impact 2012-15
Market Size (\$ Bn.)	50.4	Increasing		
Growth Rate (FY '10-FY '15 CAGR)	5.1%	Stable		
Market Concentration	~30%	Increasing		
Technology Barrier	Medium-High	Decreasing		
Price Sensitivity	Medium	Stable		
Scope for Differentiation	Yes	Stable		

Key Feature: Highly Competitive end use market Lucrative market for new product introduction

- ✓ Diversification of product line to shift focus from baby boomer generation to Gen X and Gen Y
- ✓ Building brand equity - Customers care about what they consume
- ✓ Consolidation to reduce product clutter in the market.

Strong Impact
 Weak Impact

India

Factor	Measure	Trend	Impact 2010-11	Impact 2012-15
Market Size (\$ Bn.)	2	Increasing		
Growth Rate (FY '10-FY '15 CAGR)	16%	Stable		
Market Concentration	~35%	Decreasing		
Technology Barrier	High	Decreasing		
Price Sensitivity	High	Stable		
Scope for Differentiation	Yes	Stable		

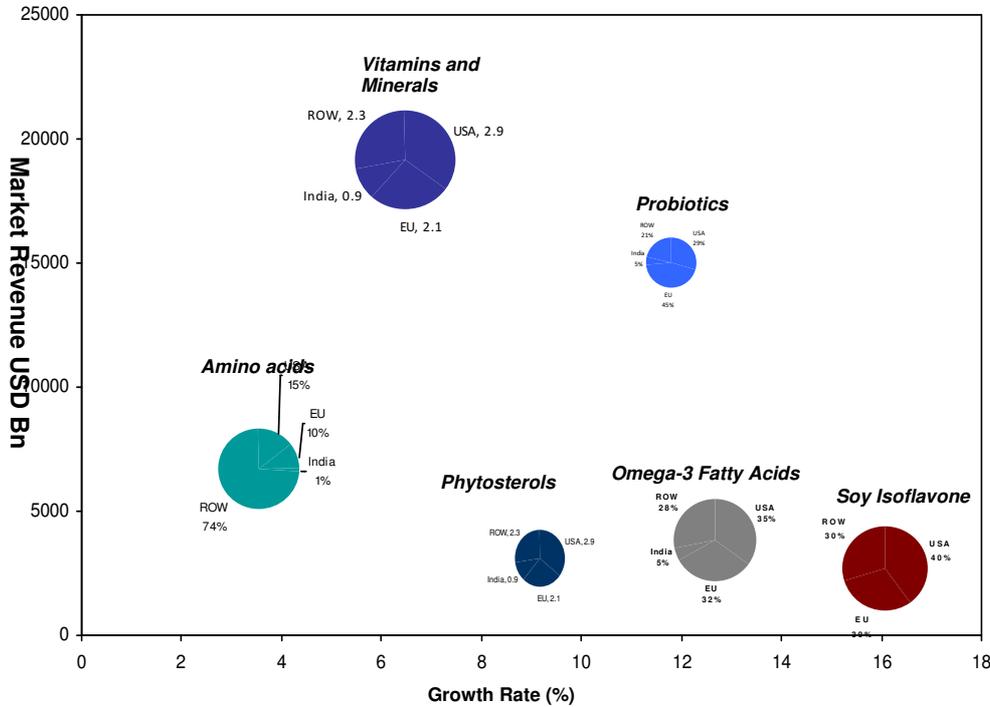
Key Feature: Lack of consumer awareness Lack of market penetration as yet, good market to enter

- ✓ Targeted marketing, advertising, and sales promotion campaigns that address specific needs of target consumers to increase market penetration
- ✓ Creating ingredient and subsequently brand equity in the market, through awareness campaigns.

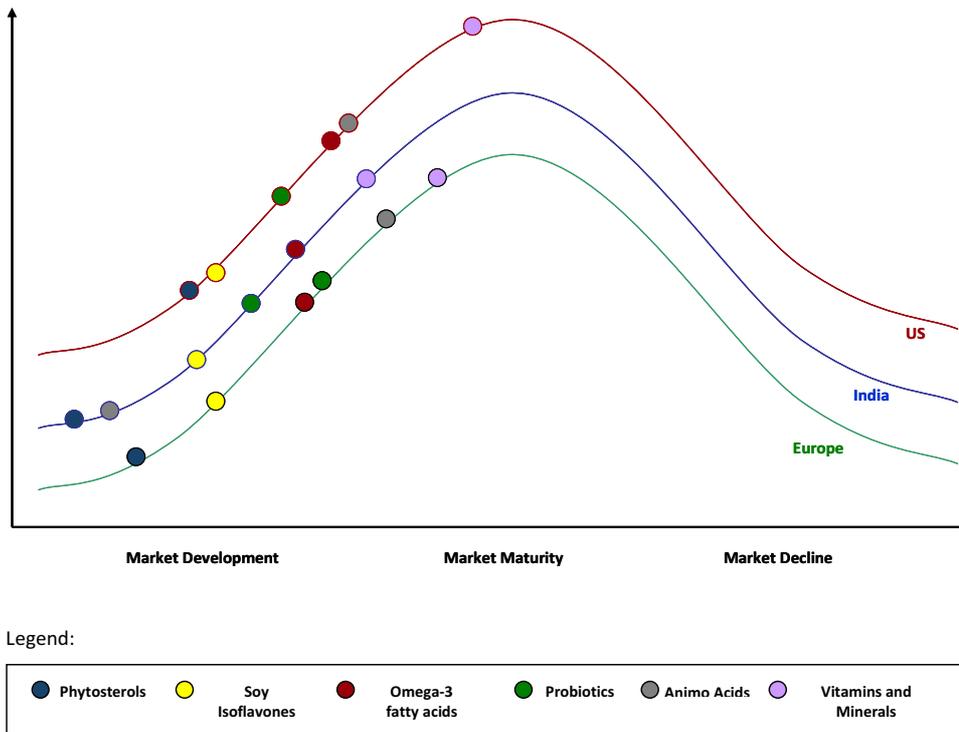
Strong Impact
 Weak Impact

Ingredient Watch: Ingredients shaping global markets

Key Ingredient Market Growth: Bubble analysis



Product Life Cycle, Status of Key Ingredients in 2010



Key Nutraceutical Ingredients, India, USA and Europe, 2010**Market Penetration Strategies: (Product Life Cycle - Introduction and Growth)**

- Investment in awareness programs to educate the public about the ingredient
- Branding, to differentiate the product and position it as a high quality, effective and value for money offering

Product Development Strategies (Product Life Cycle - Introduction)

- Investment in Research and development to develop innovative products, packaging and delivery mechanisms
- Investment in verifying health claims of the products
- Investment in market research to tune in to consumer behaviour

Market Expansion Strategies: (Product Life Cycle - Growth)

- Customisation of the product offering to suit the target audience to increase penetration
- Synergistic Mergers and Acquisition to enter new geographical and product markets
- Increased advertising and promotional activities



Nutraceutical Market: Key Take Aways

SUMMARY

- Globally, nutraceutical consumers are opting for natural nutraceutical ingredients as they believe the bioavailability of these ingredients is higher, while the risk of side effects is significantly lower.
- The global market is currently experiencing a period of growth, post recession. Even after the effect of the recession fades, the market is likely to remain in a growth phase driven by emerging nutraceutical markets, such as India, China and Brazil, with China likely to become the world's largest nutraceutical market by 2030.
- Customisation and personalisation is the need of the hour for nutraceuticals, specifically in developed markets such as US and EU. However, while complete personalization (based on genetic profile) is a long way away, companies are looking at new and innovative ingredients and/or delivery mechanism to suit specific target groups
- The US market is currently focused on diversifying their product offering to gain greater penetration amongst the Gen X and Gen Y population after having almost exhausted the baby boomer population.
- In Europe, however, the focus is more on innovation, research and development. The European market is also looking to consolidate and organize itself. European companies are looking to dominate the global nutraceutical market, as can be seen by their synergistic acquisitions worldwide.
- India is currently a nascent market for nutraceuticals, without a concrete business model in place. Both MNCs as well as domestic companies in the pharmaceutical and food and beverage space have tested the market with a variety of launches, with some success. This has resulted in increased product launches in the recent past.
- However, in terms of ingredients, especially in the case of plant extracts and phytochemicals, Indian companies have entrenched their place as suppliers, both locally as well as globally.

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