Global Nutraceutical Industry: Investing in Healthy Living
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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.
CONTENTS

Executive Summary........................................................................................................ 4

Introduction to Nutraceuticals: Then and Now.......................................................... 6

Global Nutraceutical Industry: Across Boundaries, Across Cultures....................... 13

European Nutraceutical Market: Consumer Propelled Growth............................. 19

US Nutraceutical Market: Impelling Global Growth.................................................. 25

Indian Nutraceutical Market: Growing Downstream................................................ 31

Customising Nutraceuticals ...................................................................................... 36

Focusing on the Future ............................................................................................. 41

Nutraceutical Markets: Key Take Aways ................................................................. 45
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**

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.

**Dietary Supplements**

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.

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**Varying Definitions and Regulations for Nutraceuticals around the world**

<table>
<thead>
<tr>
<th>Country</th>
<th>Given Label</th>
<th>Definition</th>
<th>Regulating Body</th>
</tr>
</thead>
</table>
| United States of America | Dietary Supplements       | Any of the following which have a beneficial nutritional effect  
  • Vitamins  
  • Minerals  
  • Botanicals and their extracts  
  • Amino Acids  
  • Concentrates and Extract | Food and Drug Authority |
| European Union          | Food Supplements           | • Concentrated Sources of Nutrients  
  • Other substances with a beneficial nutritional effect | European Food Safety Authority |
| India                   | Foods for special dietary use | • 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 | Any food that can provide and/or supplement any of the following  
  • Nutrition  
  • Sensory Satisfaction  
  • Beneficial Physiological Effect | Japan Health and Nutrition Food Association |
| China                   | Health Foods              | Any food that  
  • 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

<table>
<thead>
<tr>
<th>Vitamins</th>
<th>PUFA/ Speciality lipids</th>
<th>Phyto-Chemicals</th>
<th>Prebiotics</th>
<th>Minerals</th>
<th>Amino acids, peptides proteins</th>
<th>Fibers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Vita C</td>
<td>• DHA/EPA</td>
<td>• Phytosterols</td>
<td>• FOS</td>
<td>• Calcium</td>
<td>• Arg, Glu, Lys</td>
<td>• Insulin</td>
</tr>
<tr>
<td>• B1, B2, B6, B12</td>
<td>• ARA</td>
<td>• Isoflavones</td>
<td>• Inulin</td>
<td>• Magnesium</td>
<td>• Leu, Ile, Val</td>
<td>• Poly- dextrose</td>
</tr>
<tr>
<td>• Folic acid</td>
<td>• GLA</td>
<td>• Lignans</td>
<td>• GOS</td>
<td>• Zinc</td>
<td>• Lactoferrin</td>
<td>• Beta-glucan</td>
</tr>
<tr>
<td>• Niacin</td>
<td>• CLA</td>
<td>• Polyphenols</td>
<td>• Poly-</td>
<td>• Iron</td>
<td>• Immunglobulins</td>
<td>• Resistant starch</td>
</tr>
<tr>
<td>• Biotin</td>
<td>• Structured lipids</td>
<td>(from berries,</td>
<td>dextrose</td>
<td>• Sodium</td>
<td>• Bioactive peptides</td>
<td>• Gums such as guar gum</td>
</tr>
<tr>
<td>• Panthenic acid</td>
<td></td>
<td>olive, tea,</td>
<td>• Other</td>
<td>• Potassium</td>
<td>• Digestive enzymes</td>
<td>• Pectins</td>
</tr>
<tr>
<td>• Vita A</td>
<td></td>
<td>tomato, apple,</td>
<td>oligo-</td>
<td>• Selenium</td>
<td></td>
<td>• Resistant maltodextrin</td>
</tr>
<tr>
<td>• Vita E</td>
<td></td>
<td>grape, cocoa)</td>
<td>saccharides</td>
<td></td>
<td></td>
<td>• Psyllium</td>
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<tr>
<td>• Vita K</td>
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<td></td>
<td>(KOS, SOS)</td>
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<td></td>
<td>• Insoluble fibres</td>
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<tr>
<td>• Vita D</td>
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<tr>
<td>• B- Carotene</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Carotenoids</th>
<th>Polysols</th>
<th>Probiotics</th>
<th>Others</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• B- Carotene</td>
<td>• Xylitol</td>
<td>• Lactobacilli</td>
<td>• CoQ10</td>
<td>• Insulin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lycopene</td>
<td>• LACTITOL</td>
<td>• Bifidobacteria</td>
<td>• Glucosamin</td>
<td>• Poly- dextrose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lutein</td>
<td>• ISOMALT</td>
<td>• Other cultures</td>
<td>• Chondroitin</td>
<td>• Beta-glucan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Zeaxathin</td>
<td>• MALTOIT</td>
<td>• Other cultures</td>
<td>• Lipoic acid</td>
<td>• Resistant starch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Astaxanthin</td>
<td></td>
<td></td>
<td>• Inositol</td>
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</tr>
</tbody>
</table>
**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.

- **Cardiovascular Diseases**
  - Omega-3, Phytosterols, Fibre, Antioxidants
- **Weight Management**
  - Herbal Extracts, Fibre, Proteins, Fatty Acids
- **Cognitive**
  - Omega-3, Antioxidants, Amino Acids
- **Bone and Joint**
  - Minerals, Vitamins, Omega 3, Protein, Amino Acids, Antioxidants, Botanicals

**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: 31%
  - Functional Beverage: 33%
  - Dietary Supplement: 36%

**Nutraceutical Ingredients Market: Split by region (World), 2010**

- Market Size: US $18.2 Billion
  - North America: 16%
  - Western Europe: 24%
  - Asia Pacific: 37%
  - Rest of the World: 23%

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**Select Nutraceutical Ingredients Market, (World), 2010**

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

- **Vitamin E**
  - Revenue: $834.4 million
  - Key Participants: Royal DSM N.V., BASF AG, Adesso S.A.S., Shenjiang Medical, Shenjiang NHU

- **Soy Proteins**
  - Revenue: $572.4 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
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.

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

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

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

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.

Source: WHO Statistics
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.
European Nutraceutical Market: Consumer Propelled Growth
Nutraceutical Market: Split by Product Share, (Europe), 2010
Market Size: US $35 billion.

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

Select Nutraceutical Ingredients Market, (Europe), 2010

Vitamins and Minerals
Revenue: US $2.05 billion
Key Companies: DSM, Danisco, BASF

Amino Acids
Revenue: US $2.53 billion
Key Companies: BASF, Evonik DeGussa

Omega-3 fatty acids
Revenue: US $3.08 billion
Key Companies: DSM, Denomega, Croda

Functional Food & Beverages
Dietary Supplement

Vitamins and Minerals
Amino Acids
Omega-3 fatty acids
Probiotics
Others
Key Market Drivers and Restraints

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

CAGR (2010-2015): 5.7%

<table>
<thead>
<tr>
<th>Drivers</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
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<tbody>
<tr>
<td>Aging Population</td>
<td></td>
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<tr>
<td>Increasing cost of healthcare</td>
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<tr>
<td>Increasing number of distribution channels, allowing greater accessibility</td>
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<table>
<thead>
<tr>
<th>Restraint</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
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<tr>
<td>Slow pace of regulatory approvals for health claims due to a heavily regulated market</td>
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<tr>
<td>Cluttered product market, as a result of existing fragmentation</td>
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<tr>
<td>High cost of product development and advertising resulting in increased product costs</td>
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</tbody>
</table>

Impact

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

**Country-wise Markets:**


- **Germany**:
  1. Boosts Immune System
  2. Promotes Healthy Bones
  3. Promotes Healthy Teeth
  4. Gives Energy
  5. Promotes Health Gut

- **United Kingdom**:
  1. Gives Energy
  2. Promotes Healthy Bones
  3. Promotes Healthy Teeth
  4. Reduced Risk of Health Cancer
  5. Lowers Cholesterol

- **France**:
  1. Gives Energy
  2. Lowers Cholesterol
  3. Increases Disease Resistance
  4. Boosts Immune System
  5. Prevents Constipation

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**

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.
Europe: Key markets and Innovation hubs

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 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.
US Nutraceutical Market: Impelling Global Growth
Nutraceutical Market: Split by Product Share (USA), 2010
Market Size: US $ 50.4 billion

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

Source: Frost & Sullivan analysis

Select Nutraceutical Ingredients, (USA), 2010

Vitamins and Minerals
Revenue: US $ 3820 million
Key Companies: DSM, Danisco, BASF

Omega-3 fatty acids
Revenue: US $ 470 million
Key Companies: DSM (Martek), Croda, EPAX, Pronova Biopharma

Probiotics
Revenue: US $ 68 million
Key Companies: Danisco A/S, Chr Hansen, Morinaga, and BioGaia

Amino Acids
Revenue: US $ 1675 million
Key Companies: BASF, Evonik, Degussa, Ajinomoto
Key Market Drivers and Restraints for Nutraceutical Products:

Market Drivers and Restraints (US), 2010 – 2015

CAGR (2010-2015): 5.1%

<table>
<thead>
<tr>
<th>Drivers</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby Boomer population (74-75 mn)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing cost of healthcare</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of recession</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Restraint</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturing Market</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluttered product market, as a result of existing fragmentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slow pace of regulatory approvals for health claims due to a heavily regulated market</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Impact

- High
- Medium
- Low
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**

<table>
<thead>
<tr>
<th>Reason</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of Use</td>
<td>54%</td>
</tr>
<tr>
<td>Professional Recommendation</td>
<td>50%</td>
</tr>
<tr>
<td>Price</td>
<td>49%</td>
</tr>
<tr>
<td>Read About it</td>
<td>41%</td>
</tr>
<tr>
<td>Health Claim</td>
<td>39%</td>
</tr>
<tr>
<td>Brand</td>
<td>14%</td>
</tr>
</tbody>
</table>

**Consumer Insight: Key Health Concerns, US 2010**

<table>
<thead>
<tr>
<th>Health Concern</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Eyesight</td>
<td>90%</td>
</tr>
<tr>
<td>Cancer</td>
<td>80%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>70%</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>60%</td>
</tr>
<tr>
<td>Arthritis</td>
<td>50%</td>
</tr>
<tr>
<td>High Cholesterol</td>
<td>40%</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>30%</td>
</tr>
<tr>
<td>Stress</td>
<td>20%</td>
</tr>
<tr>
<td>Mental Acuity</td>
<td>10%</td>
</tr>
</tbody>
</table>
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.
A direct impact of the need for diversification in the US market can be observed in the recent product launches in the nutraceuticals space.

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

- 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
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%**

<table>
<thead>
<tr>
<th>Drivers</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing consumer health awareness</td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
</tr>
<tr>
<td>Increase in disposable income</td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
</tr>
<tr>
<td>Increased co-prescription with regular drugs</td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
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<table>
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<tr>
<th>Restraint</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Markup and market skimming practices</td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
</tr>
<tr>
<td>Lack of regulatory framework to validate health claims</td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
</tr>
<tr>
<td>Inadequate investments in food research sectors</td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
<td><img src="circle.png" alt="Circle" /></td>
</tr>
</tbody>
</table>

**Impact**
- High
- Medium
- Low
**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.

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 food and beverages are expected to witness much higher growth rates when compared to dietary supplements over the next five years.
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 cordonned 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 lifestyle 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.
Focusing on the Future
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

<table>
<thead>
<tr>
<th>Factor</th>
<th>Measure</th>
<th>Trend</th>
<th>Impact 2010-16</th>
<th>Impact 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Size ($Bn.)</td>
<td>35</td>
<td>Increasing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth Rate (FY 10-15 CAGR)</td>
<td>5.7%</td>
<td>Stable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Concentration</td>
<td>~20%</td>
<td>Increasing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology Barrier</td>
<td>Medium-High</td>
<td>Decreasing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price Sensitivity</td>
<td>Medium</td>
<td>Stable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope for Differentiation</td>
<td>Yes</td>
<td>Stable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key Feature: Health Claim - Other 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

### USA

<table>
<thead>
<tr>
<th>Factor</th>
<th>Measure</th>
<th>Trend</th>
<th>Impact 2010-16</th>
<th>Impact 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Size ($Bn.)</td>
<td>50.4</td>
<td>Increasing</td>
<td></td>
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</tr>
<tr>
<td>Growth Rate (FY 10-15 CAGR)</td>
<td>5.1%</td>
<td>Stable</td>
<td></td>
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</tr>
<tr>
<td>Market Concentration</td>
<td>~30%</td>
<td>Increasing</td>
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</tr>
<tr>
<td>Scope for Differentiation</td>
<td>Yes</td>
<td>Stable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key Feature: Highly Competitive and Use market Lucrative market for new product introduction

- Differentiation 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.

### India

<table>
<thead>
<tr>
<th>Factor</th>
<th>Measure</th>
<th>Trend</th>
<th>Impact 2010-16</th>
<th>Impact 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Size ($Bn.)</td>
<td>2</td>
<td>Increasing</td>
<td></td>
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</tr>
<tr>
<td>Growth Rate (FY 10-15 CAGR)</td>
<td>16%</td>
<td>Stable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Concentration</td>
<td>~35%</td>
<td>Decreasing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology Barrier</td>
<td>High</td>
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<tr>
<td>Scope for Differentiation</td>
<td>Yes</td>
<td>Stable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
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.
ABOUT FROST & SULLIVAN

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Frost & Sullivan is a Global Growth Consulting Company headquartered in Palo Alto (Ca), United States. The pioneer of Growth Partnership Services, Frost & Sullivan has been successfully providing innovative solutions and strategies to maximize growth opportunities for its clients for the last 45 years. With over 40 offices spread across 6 continents, and a Consultant team of more than 1600 analysts, the company offers strategic information and advice in almost all countries in the world.

Our combinational approach of measurement-based and solution focused market analysis has given us an impeccable reputation in world markets. This approach ensures a high degree of accuracy in our research and in growth strategies provided by us. The basis of our research and consulting practice is the patented Market Engineering System™, used to provide the Technological, Economic, Application and Market solutions to our clients.

In India, our market expertise covers a broad spectrum of verticals (technology, healthcare, automotive, chemicals, industrial and process consulting) while our portfolio of advisory competencies includes custom strategic consulting, market intelligence, summits & conferences and management training. Our mission is to forge partnerships with our clients’ management teams to deliver market insights and to create value and drive growth through innovative approaches.

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Established in 1927, FICCI is the largest and oldest apex business organization in India. Its history is closely interwoven with India’s struggle for independence and its subsequent emergence as one of the most rapidly growing economies globally.

FICCI has direct membership from the private as well as public sectors, including SMEs and MNCs and an indirect membership of over 83,000 companies from regional chambers of commerce. With a Membership of over 500 Chambers of Commerce, Trade Associations Industry bodies, the Chamber speaks directly and indirectly for over 2,50,000 small, medium and large business units employing around 20 million people.

FICCI works closely with the government on policy issues, enhancing efficiency, competitiveness and expanding business opportunities for industry through a range of specialized services and global linkages. It also provides a platform for sector specific consensus building and networking. FICCI also partners with regulators and international agencies including World Bank, International Finance Corporation, RBI, SEBI, BIS, ADB, ICAI in arriving at solutions on burning issues concerning Capital Market, Banking, Corporate Governance, SME, Finance, WTO etc.

The Head Office of FICCI is located in Delhi. It has 8 State offices and 6 International Offices. FICCI-Western Regional Council is the western regional arm of the Federation of Indian Chambers of Commerce & Industry. In addition to supporting FICCI, New Delhi, FICCI-WRC organizes its own conferences, seminars, workshops and networks with visiting delegations from several developed and developing countries.


FICCI has an active sector on Nutraceuticals which researches issues and explores potential for further growth. The sector is engaged in arranging conferences, seminars and workshops on various areas of Nutraceuticals, thus creating a platform for discussion and growth.

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