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Executive Summary

Market Overview

Introduction

North America is known as the land of plenty. Plenty indeed, in the United States alone about 60 to 70 million Americans suffer from problems that are associated with the digestive system; Canada is not far behind. A poor consumption habit is cited as a major factor that has led to these problems. Other factors include the heavy use of additives in overly processed food as well as the rising intake of antibiotics or drugs such as prednisone. All these contribute to the disruption of the gastrointestinal tract's natural equilibrium. The gut's natural flora of 100,000 billion viable microorganisms is made up of about 400 to 500 species of bacteria, the most abundant of which are from the *Lactobacillus* and *Bifidobacterium* species. While all probiotics are considered live active cultures, not all live active cultures are necessarily probiotic. According to the most widely accepted definition of probiotics given by the Food and Agricultural Organization of the United Nations (FAO) in 2002, probiotics are live microorganisms administered in adequate amounts which confer a beneficial health effect on the host. This research service is an analysis of the current status and prospects of the North American probiotics market for human nutrition, and it is based on this accepted definition of probiotics. Starter cultures, *Lactobacillus bulgaricus* and *Streptococcus thermophilus* that are used in the fermentation of yogurt are generally not considered by the industry to be probiotic and will therefore be excluded from the study. All information gathered for this research service is analyzed and presented at the retail level.

Scope of Research

This research service analyzes the North American human food probiotics market from 2003 to 2013, covering the following application segments:

- Probiotic yogurt and other probiotic food applications
- Probiotic dietary supplements

A market overview is provided for each of these application sectors, that includes recent developments in legislation, various product launches, pricing and margin analysis, end-user trends and a general overview of the competitive environment of this industry from the food manufacturer's perspective.

Geographically, the study will focus on the United States of America and Canada.

Research Methodology

This study focuses on drivers, restraints and challenges within the human food probiotics industry in North America. The compilation of market trends and forecasts reflects the total research. The research was approached from a business-to-consumer perspective.

The views expressed in this research service reflect Frost & Sullivan's views, based on primary and secondary research with industry participants, industry experts, end-users, regulatory organizations, the financial and investment community and other related sources. Frost & Sullivan takes no responsibility for any incorrect information supplied to us by manufacturers or end-users.

In addition to the above, Frost & Sullivan's robust in-house forecasts and benchmarking models have been instrumental in the completion and publishing of this research service. Market estimates have been validated by internal data modeling.

It is impossible to take into account unexpected shifts in demand that emerge as a result of unforeseen price, production problems, seasonal demand or regulatory changes, consumer or end-user characteristic changes, or any other significant future events that occur after the research process is complete.

Segmentation Rationale

In both the United States and Canada, probiotics are commonly found in either food, or as dietary supplements. The analysis of the probiotic market was based on type of application or delivery format. Therefore, it was segmented into two broad categories: Probiotic Foods and Probiotic Dietary Supplements.

Under probiotic foods, yogurt is the single most dominant product form in the North American probiotic market for human nutrition. It is also the most established, when compared with other formats. Retail channels showcase a number of brands in different varieties of probiotic yogurt. This product form is widely accepted and has the highest potential for growth compared to all other food application. All other probiotic food applications including cheese, fruit juice, cereals, infant formula, and confectionery are considered emerging products. They are launched or introduced to the market in the latter part of 2006 or in 2007. Hence, such products are grouped together under the 'Other Foods' section of the same chapter.

The Probiotic dietary supplements industry is discussed in more detail following the probiotic foods chapter. It includes tablets, capsules, sachets, powders that are marketed through mass distribution channels such as supermarkets or groceries, health food stores, pharmacies or through direct sales such as over the internet and through healthcare professionals like doctors for instance.

The focus of this research service will be on these two application segments.

Summary of Major Findings

Market Growth and Opportunities

Market growth for probiotics is promising not only for applications in food and dietary supplements but for other applications such as clinical nutrition and nutricosmetics as well. The revenue forecasts and their discussions are presented in the respective market segments for probiotic yogurt and dietary supplements of this report.

The assumptions that were considered to determine the value of the North American probiotics market for human nutrition are as follows:

1. Market sizing is measured at the processing stage within the value chain, however excludes the manufacturer's margin. The forecast is based on historic and expected growth for probiotic products at the retail level.
2. Market revenues including market shares presented for the probiotic food market and for the probiotic dietary supplement are from a business to consumer perspective.
3. Starter cultures *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, used in the fermentation of yogurt and generally not considered by the industry to be probiotic, were excluded from the valuation.
4. The word "manufacturer" pertains to food and supplement processors who are end-users of the probiotic raw material. Manufacturers of the probiotic raw material are referred to as "suppliers".

Taking all these assumptions in mind, the total North American probiotics market for human nutrition is currently valued at \$698.0 million, with an annual growth rate of 13.8 per cent. The compound annual growth rate (CAGR) over the period from 2006 to 2013 is forecast to be 13.7 per cent.

Suppliers of probiotic cultures are optimistic that the market will continue to exhibit robust growth. Factors such as increasing levels of awareness as well as continued interest from manufacturers in pharmaceutical, cosmetic firms and other manufacturing firms will further drive the market. The demand for probiotic products is strong in North America and its potential is not fully realized. More probiotic products are being developed to cater to specific needs of every age group and gender thus creating niche markets. These niche markets offer a differentiation strategy that extends the product portfolio while maximizing current resources. There is a huge gap in product offerings that cater to the aging baby boomers and adult men. Other high growth areas include infant nutrition, as well as the clinical nutrition market. However, regulations for these products are more restrictive and could potentially delay market launch. To illustrate, according to Mintel GNPD, there have been 204 launches of yogurt and probiotic drinks in 2006 just for the United States; whereas there was only one probiotic infant formula launched in the same year.

Probiotics applied to cosmeceutical products could be the Holy Grail that could make the North American market surpass Europe or even Asia in probiotic consumption; the highly attractive high margin returns of the cosmetics industry as consumer demand intensifies for natural, food-based beauty products. Some scientific research based on probiotics for skin protection' and 'new probiotic application for the personal care industry: development in oral care for caries prevention are underway in this field. In a way, any human body system where indigenous microorganisms are normally depleted could become a potential area for product development and marketing. There is a great prospect for further growth in retail probiotic products for as long as the suppliers and processors remain sensitive to the needs of the consumers. Consumers' top priorities include growing demand for convenience foods, increasing concern for health and well being and food products that can deliver superior health properties without affecting the taste parameter. The ability and speed by which suppliers can respond to these needs would determine their success in the industry.

Market Challenges Drivers and Restraints

Key Industry Challenges

Several challenges have been identified and discussed in this study. Some examples of those that have a significant impact on the North American probiotics market for human nutrition include:

- Low Consumer Awareness
- Difficulties in Product Development
- Changing and Increasing Demands from Food and Supplement Manufacturers

Low consumer awareness was cited by the majority of the players and remains the greatest challenge in this market. Based on interviews during the research, the level of awareness of probiotics in the United States is less than 40 per cent from 2005 to 2006. The use of the term *probiotics* or *beneficial bacteria* in the United States is not as popular as the term *active cultures*. In supplements, consumers are generally more familiar with the word *acidophilus*, and appear to be oblivious that it is a probiotic strain. Related to this is consumer confusion of the different strains and skepticism on their efficacy. This challenge is being addressed by continuous marketing efforts from both suppliers and manufacturers of finished goods and has significant impact on the market's further growth.

Other challenges are presented and are discussed in more detail in the Chapter 3 of this study.

Key Market Drivers

Examples of the market drivers that have the most significant impact on the growth of the North American probiotic food market include:

- Palatability of the Finished Product Propels Volume Growth
- Portable Portions that Offer Convenience Boosts Market Growth
- Product Innovation in Application Formats Fuels Revenue and Volume Growth

Palatability is the primary motivator for most food product purchases. One product could provide more health benefits than others and yet does not guarantee its success in the marketplace. Probiotics have been successfully incorporated into foods such as chocolate, wafer cookies, cereal, fruit juices and cultured soy products without any disagreeable taste; making probiotics more accessible to a wider group of people. Palatability of the finished product is a driver that has an immediate impact on industry growth and will continue to have a high impact on market growth in the medium and long terms.

Some other examples of market drivers that have the most significant impact on the North American probiotic supplement market include:

- Natural Affinity for Supplements Promotes Demand
- Growing Interest from Pharmaceutical Companies Expands the Market
- Higher Stability and Longer Shelf-life of Probiotics Facilitate Growth

North America is known as a supplement consuming nation, a trait that will continue to drive the development of nutraceuticals and supplements. Americans have become overly reliant on a slew of drugs that essentially substitute for a healthy lifestyle. Due to the rising number of product formats being introduced in the probiotic category, consumers are now presented with more sources of nutrition as well as several new options for maintaining health and wellness. As a result of rising healthcare costs and the advent of the internet, consumers have become more informed and are able to self-diagnose. This penchant for supplements and interest in health has spawned supplement products that target specific ailments; VSL#3® is marketed as a medical food that contains a mix of eight different strains to relieve pouchitis as one example. Natural Affinity for Supplements is a major driver; however, the presence of multiple substitute products tones this down to a medium effect on the growth of the market in the short term. On the other hand, combined with increasing levels of awareness for probiotics, Natural Affinity for Supplements as a driver will have a high impact in the medium to long term range.

Key Market Restraints

The most significant restraints that impact the growth of the North American probiotic food market include:

- Limited Stability of Probiotic Food Products Constrains Application Formats
- Higher Retail Price Versus Nonprobiotic Food Products

The limited stability of probiotic food products constrains application formats. The dairy medium is not a stable environment for probiotic bacteria. Often, bacterial strains are not protected and they are very sensitive to moisture, light and temperature fluctuations in addition to the changes in acidity. While probiotics have been recently applied to room temperature food products such as cereal, they are relatively new and not yet established. This limiting factor will change from a current medium rating to a low impact in five to ten years as more technological breakthroughs are discovered and tested.

Restraints that have a significant impact on the growth of the North American probiotic supplement market include:

- Nonexistent Standards that Check for Viability Erodes Consumer Trust
- Presence of Substitute Products Compete for Market Share

Under the lack of quality control standards, it is becoming increasingly difficult to check for viability and potency of bacterial cells in supplement products. There are no guidelines that can assist consumers in purchasing products that are suitable for specific health conditions. This instigates consumers to resort to products that have a less perceived risk but not necessarily solve their health problem. Industry players have sought the help of independent, third party firms to verify product quality and label declarations. However, some supplement manufacturing firms have contested their methods which have cast some doubt on findings. The impact of this restraint is medium in the short term and if left unchecked, will have a high impact on market growth in the medium to long term.

These, and additional drivers and restraints are presented and discussed in detail in the following chapters of this research deliverable.

Product and Application Trends

Probiotics have popular applications in dairy based products and in dietary supplements. In the dairy delivery format, probiotics have long been applied to yogurt. The yogurt category is a mature market in Europe compared to the United States or Canada; a good example is the drinkable yogurt sub-category, the United States market witnessed the introduction of the first drinkable yogurt with probiotics DanActive™, launched by The Dannon Company in January of 2007. However, the counterpart of DanActive™, Actimel® has been available in Europe for more than 10 years. Drinkable yogurt is fast becoming popular with young consumers due to its good taste, portability, attractive packaging and effective marketing program.

Improved technology and better bacterial resiliency has produced innovative products in the marketplace. However, for the United States probiotics market, the dominant applications would still be in the form of dietary supplements and yogurt.

Competitive Analysis

The supply chain in the probiotic industry is quite diverse with many levels. There are a lot of overlapping activities as well as collaborations amongst tiers. Several of these suppliers could also be classified across multiple tiers, depending on their business activity. A thorough discussion including examples of companies is provided in Chapter 2 of this research service.

Tier 1—Strain Licensor

Tier 2—Multinational Ingredient Companies

Tier 3—Bulk Producers/Technology Providers/ Private Label Manufacturers/Semi-Finishers

Tier 4—Captive Users / Processors/Food or Supplement Manufacturers

Tier 5—Marketing Companies/Distributors

In 2006, there were an estimated 150 to 200 companies who were actively engaged in the business of producing and marketing of probiotic cultures and finished products in North America. The group of probiotic suppliers is highly concentrated, dominated by a few large competitors namely Chr. Hansen, Danisco and Lallemand that collectively control more than half the of the entire industry's supply. Danisco and Cargill established a strong market share position through industry acquisitions; Danisco with its purchase of Rhodia, and Cargill's take-over of Degussa. On the contrary, there are numerous buyers that are characterized as highly fragmented. Due to the unique nature of the business, there are high entry barriers that successfully deter a lot of companies from entering this market as a supplier. Apart from high fixed costs and a specialized knowledge of handling tenuous microorganisms, a significant total dollar investment is crucial for continued research and development, so that health claims can be substantiated and more innovations in probiotic applications are discovered. The use of proprietary product technology and patents to protect product technology and process innovations are critical factors that can provide a competitive edge over others regardless of firm size. However, the opposite is true when entering this market as a finished product manufacturer. Prospective players either by acquisition of existing brands or the development of new products have the full support and service of culture suppliers, who are able to provide third party manufacturing facilities in addition to technical assistance and even advice for regulatory approval. Easy access to materials and production, plus the lack of regulatory controls has encouraged numerous companies particularly in the dietary supplement segment to enter this market. These companies only handle the marketing and distribution aspect of probiotic retail products; whether these products are indeed efficacious is another matter. There is ample opportunity for every player to gain some share of the industry's profits at retail level, through product differentiation and consumer switching costs. Since there is a variety of substitute products that promise similar benefits for digestive health that are available, enzymes and fiber are among some popular choices; switching costs are low. Consumers have the tendency to try out one form after another to determine what the best remedy is for their situation.

The probiotic ingredient is a small fraction of the buyer's costs but it is a significant factor for the buyer since branded strains have more clinical studies and higher efficacies compared to generic strains. Switching costs for buyers tend to be high since a great amount of time and resources are spent on establishing the formulation, production and proper shelf-life studies; not to mention that investment poured into marketing of the branded strain. Even if there are three dominant suppliers in this market, the buyers are far bigger than the supplier firms. Companies such as Danone, Nestle, and Yoplait have more resources compared to their suppliers. However, the probability of buyers integrating backwards to produce the strains themselves is highly doubtful. Similarly, it is not likely that major culture suppliers would integrate forward into the buyers industry with retail products. There are exceptions such as BioGaia a licensor of their proprietary *L. reuteri* strain who have gone into infant drops and supplements under the BioGaia brand. These product offerings though are limited in distribution and they do not produce the product themselves.

The industry is currently in an early-growth phase with higher growth rates for the probiotic foods compared to probiotic supplements. Competition at this stage cannot be characterized as intense due to the high degree of product differentiation, buyer's high switching costs. Despite the high fixed costs there is ample opportunity for penetration into newer markets and applications to gain a piece of this rapidly growing market.

Conclusions and Recommendations

In this fast developing market, the principal dilemma for the industry is how to attract first-time buyers and how companies can achieve significant market penetration. There is a need for cooperation during the growth phase; it would be in the best interest of all market participants to help promote standardization, police substandard quality and fake products. Consistent, high quality performance of suppliers to its customers and other stakeholders is crucial for continued market growth. Non-traditional distribution channels and marketing tactics should also be examined, along with the continued organization of industry conferences and associations that are useful devices in increasing awareness. The probiotics industry is a complex yet highly attractive market, just as finicky and as tailored as the bacteria itself. Understanding the nature of the business requires an open mind, patience and an almost fanatic trust that a billion cells per day is where success will lay.