Analysis of Technology and Market trend analysis of Probiotics

Yunjeong Choi
Korea Institute of Science and Technology Information, Korea
E-mail : yjchoi@kisti.re.kr

1. Introduction

The compound word " probiotics" is formed from the words "Pro = benevolent" and "Biotics = organism related". In other words, Probiotics mean microorganisms that provide health benefits when consumed. Probiotics are mostly lactic acid bacteria, and includes some Bacillus. The efficacies of probiotics are proliferation of beneficial bacteria, inhibition of harmful bacteria, intestinal regulation, blood cholesterol reduction, immune enhancement, suppression of endogenous infection, anti-cancer, and etc. Thus, probiotics are actively utilized in various pharmaceutical market including dairy food &beverage. In Korea, probiotics are recognized as lactic acid bacteria and considered as supplement or item of personal preference among health functional foods. However, probiotics are considered as necessity for intestinal health in Europe and Japan. Currently, mainly used probiotics are lactobacillus, streptococcus, and bifidobacterium. These bacteria must meet several requirements. It is more preferable for a strain to exist in a host cell, and also be able to go through upper gastrointestinal tract without dying. Furthermore, bacteria should be capable of proliferating in lower digestive tract, have useful effects in intestines, survive in food processing conditions, safe, minimize the side effects, not be resistant to the antibacterial substances, have a wide antibacterial range, and ensure quality during storage.

2. Status of market trends and competition

Probiotics market includes functional food, food additives, animal drugs, human drugs, cosmetic raw material, fermented milk, and etc. Currently, probiotics are mainly utilized in fermented milk and other diary food & beverage. As interest in health care increases due to global wellness trend and increase in population aging, demand for probiotics is also steadily increasing. The size of world market is about 29 trillion Won in 2013. Although Asian market is growing relatively fast, the size of market is insignificant and is about 3500 billion Won. More than half of Asian market is formed as Japanese market.

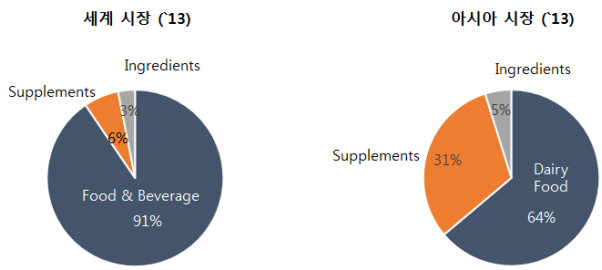

Figure 1. probiotics market sector

Market is expected to grow even more steeply by the improvement in reliability of scientific evidence about functions of probiotics, the rise of consumer awareness, and increase in interest for healthcare. Probiotics market in Korea is expected to grow significantly due to Korea's fast entry into the fast-aging society.

There are a number of minor probiotics manufacturers around the world. In advanced market, however, are leading companies such as Denmark's Danisco and Chr. Hansen, Lallemand Japan's Morinaga, and so on. These major companies are acknowledged for production technology that enables live lactic acid bacteria to be delivered to diary food & beverage companies worldwide.

In Asian market, Japanese companies have the largest market share. Yakult of Japan has 35%, Meiji Daireis of Japan has 19.8%, Chr. Hansen of Denmark has 15.7%, and Morinaga of Japan has 10.7%. These top 4 companies dominate the market structure by taking 81.2% market share.

In Korea, Cell Biotech is the only recognized lactic acid bacteria company for its original fourth generation coating technology. But other small and medium-sized businesses have inadequate outcome and thus additional companies are required to enter the market. However, as characteristics of health functional food, low probability of

success, long-term R&D investment, complexity of patent and product authentication process, and existence of regional differentiation are barriers for minor businesses to enter the market.

The major R&D project in probiotics business is coating technology. The coating technology is to coat and protect lactic acid bacteria from acid in the body. The lactic acid bacteria are not able to survive the concentration of gastric acid. Thus, it is important to develop a customized technology since the concentration depends on the country and body condition.

It is important for the coated lactic acid bacteria to endure gastric acid, break out of the coat at the exact moment in the intestine, and survive. There are four generations related to this coating technology. 1st generation is non-coated, 2nd generation is enteric-coated, 3rd generation is fine-coated, and 4th generation is double-coated. The first generation of non-coated lactic acid bacteria is destroyed by high body temperature and gastric acid. It is not effective but currently takes 70-80% of the total market in terms of cost advantage. The second generation technology is enteric coating. It protects bacteria from gastric acid and delivers them safely to intestine. This technology is used partially in the United States and Canada. However, it is not suitable with various domestic concentration of acid and can cause gastrointestinal disorders. Also, lactic acid bacteria can't penetrate the coating and the technical limitation exists. The third generation is fine coating technique and is mainly used in Japan. It is effective when used as food ingredient. However, there is high death rate and immunological limitation like the second generation. In addition, the coating material and coating rate may be uneven and cause it not to burst in intestine. Thus, it can be secreted with feces, causing a concern. Korea's Cells Biotech has patented the fourth generation technology. It can easily be worked with various gastric acid concentrations and get to the intestine to proliferate. However, the technology is more related to drugs than food. Expansion to the main market of food and beverage is required. If the fourth technology is developed to expand its usage in food field or go beyond Japan's fine-coating technology with patent on lactic acid bacteria in food field, the technology will become even more attractive.

3. Conclusion

If the interest in health concerns increases, scientific evidence about function of lactic acid bacteria activates, prices cuts, and high functional technology develops due to restriction on special medicine, the market of probiotics is expected to grow further. Korea, in particular, cannot get out of aging society. Thus the demand for probiotics and other functional food for health will increase gradually. Domestic probiotics market in Korea currently consists of foreign products from Japan and Denmark. Therefore, an entry of a domestic company has high growth and possibility of penetration. If the company produces Korean-model lactic acid bacteria at a low cost with a better understanding of domestic state, the market is extremely attractive. However, since long-term R&D investment cannot be avoided, the key is to cope with national authentication process thoroughly and to target Southeast Asian market instead of Korea's small market. Technology development and differentiated marketing toward Southeast Asian market will be the key to success in business.

4. References

[1] M Saxelin, "Probiotic Formulations and Applications, the Current Probiotics Market, and Changes in the Marketplace: A European Perspective", Clinical infectious diseases, 2008, Vol. 46, Pages 76-79
[2] SH Khan, FA Ansari, "Probiotics--the friendly bacteria with market potential in global market.", Pakistan Journal of Pharmaceutical Sciences, 2007, 20(1):76-82
[3] C Stanton, G Gardiner, H Meehan, "Market potential for probiotics", The American journal of Clinical Nutrition, 2001 vol. 73 no. 2 476s-483s
[4] "THE PROBIOTICS MARKET: INGREDIENTS, SUPPLEMENTS, FOODS", BCC Research, 2011
[5] "Strategic Analysis of the Asia-Pacific Probiotic Cultures Market", Frost & Sullivan, 2012
[6] WH Holzapfel, U Schillinger, "Introduction to pre-and probiotics", Food Research International, 2002, Volume 35, Issues 2–3, 2002, Pages 109–116