

The Trend of Fermented Foods

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Abstract

Fermented food is one of the traditional human diet cultures. In early human history, it is mainly used in food preservation and taste increases. Western medicine has long been less help for some difficult chronic diseases. Some studies have shown that the gastrointestinal tract is directly related to immunity, nerves, metabolism, and the like. The microbiota of the gastrointestinal tract is closely related to health. Turning the unbalanced into balanced microbiota can often reverse the diseases and restore health, especially for chronic or degenerative diseases that are currently difficult to have drug effects, such as Parkinson's disease (PD), Alzheimer's disease (AD), depression, and cancer, etc. The discovery and research of probiotics have demonstrated their health effects by helping balance or formation of beneficial microbiota in gastrointestinal tract. Supply of probiotics has become a good way of health care in people's daily life. Fermented foods not only provide important nutrients, functional active ingredients, but also provide a group of active microorganisms that are beneficial to the body health, which can repair, balance or maintain the healthy microbiota of the gastrointestinal tract. Driven by the health care trend, fermented food has become an option for people to maintain health. Scientists have begun to interest in the feasibility of using single or combined natural herbal ferments for use in difficult diseases. Initial results have also shown significant effectiveness and they are expected to be an improvement or resolution of unresolved ill diseases in the future. In spite of fermented food or herbal medicine, it is necessary to construct a good quality of fermented food or herbal ferment. In the fermentation process, selected specific microbe or microbiota, and developed chemical and biological analysis methods to confirm the quality of the food after fermentation, and clarified the microbial population in the food after fermentation are necessary. The final products are confirmed the beneficial microbe or microbiota and show the evidence of clinical safety and efficacy. In order to widely promote the fermented foods in market in the future, the products should be cheaper than that of the current market products. One approach is researched to shorten the fermentative process which can increase inventory turnover.

Keywords: Fermented Food; Microbiota; Probiotics; Chronic or Degenerative Diseases

Introduction

Fermented food is one of the human diet cultures. After thousands of years of human use, it has become a daily diet culture in human society. Fermented foods are initially for food preservation, and then enhance the food flavor and organoleptic properties. In the past centuries, the rapid society progress, economy growth, rising life pressure, diet imbalance, and aging population increase have led to the emergence of many chronic or degenerative diseases. In recent years, fermented foods have begun to receive more attention. The most promising food components as vitamins, minerals, fatty acids, carotenoids, polyphenols, bioactive peptides, probiotics, creatine and saponins have therapeutic potential, especially for anti-inflammatory, anti-oxidative properties and neuronal protection [1]. Plant products such as Legumes, fruit and cereals are natural sources of prebiotics. Using these plant foods as sources of fermented foods for human health products are generally used among the Asian people. It was first developed in Japan in the early days, and later the trend was spread to Taiwan, South Korea and China. Traditional fermented foods are solid and non-solid. Solid-state fermented foods include natto, bean curd, sauerkraut, yogurt, kimchi, pickled cucumber, fermented sausage, etc. Non-solid fermented foods are wine, beer, and other beverages. Nowadays, the awareness of health effect for fermented foods is getting better and better recognized in the society, resulting in people are willing to purchase them. The fermented food gradually becomes a life style of health care.

Gut Microbiota and Health

There is a growing interest in research to investigate the importance of gut microbiome in health and diseases. Recent studies have shown that gastrointestinal disorders are important factors. The brain-gut axis interactions are significantly modulated by the gut microbiota via immunological, neuroendocrine, and homeostasis mechanisms. Dysregulation of the brain-gut-microbiota axis in aging [2-4], PD [5-7], AD [8-10], energy homeostasis (pathogenesis of obesity and type 2 diabetes mellitus (T2DM) [8,10] is usually associated with gastrointestinal disturbance frequently preceding clinical symptoms, as well as with the pathogenesis itself. Amelioration of clinical symptoms as physical frailty, clostridium difficile colitis, vulvovaginal atrophy, colorectal carcinoma, and atherosclerotic disease of older adults by manipulating microbiota and microbiome of older adults can be innovative strategy [3]. There is increasing interests that are the gut microbiome in health and diseases [8] and interaction between host genetics

and gut microbiota [2]. The change in gut microbiota and colonic gene expression is obviously related to aging, especially the strong correlations between specific bacterial genera and host gene expression [4]. Imbalances in the gut microbiota can induce inflammation that is associated with the pathogenesis of obesity, type 2 diabetes mellitus, and AD [10].

Probiotics

In the recent years, the health care of the gastrointestinal tract has become the focus of attention. Microbiota balance or probiotics enhancement can be beneficiary to health. Some studies have shown that probiotics have a significant improvement in chronic or degenerative diseases [11-16]. The prebiotics and probiotics can maintain a healthy microbiome or restore balance [17]. At present, Biotech companies provides the market with a variety of different probiotics, either one single or various prescribed probiotics combination in beverage or various dosage forms as powders or granules. One of the main formulas of probiotics, provided by Biotech companies, is synbiotics, which use selected probiotics with their prebiotics, for use in humans or animals. Prebiotics are usually chosen foods for probiotics in order to help proliferating probiotics in the digestive tracts. The general public also began to try to solve some life problems, such as constipation, allergies and so on, with probiotics.

Fermented Foods and Health

Except increase of food shelf life, safety, and organoleptic properties, the fermented foods have enhanced nutritional and functional properties and produced a versatile source of bioactive molecules and bioactive microbes during fermentation process. The fermented food with bioactive microorganisms may improve gastrointestinal health and provide health benefits, including lowering the risk of type two diabetes and cardiovascular diseases [18-21].

Safety in Microbiota of Fermented Foods

Many traditional fermented foods used the nature fermentation are in market. The difference in the microbiota of traditional fermented foods varies with the geographical origin and manufacturing process. If the food is spontaneously fermented that the bacteria are from food itself or environment, the microbiota of fermented foods is unclear and often presents diverse developments [22-24]. Fermented foods are generally produced using a starter, a dominant microbiota from reused fermentation material, that has been demonstrated to become clear and

stable microbiota. The traditionally fermented foods with selected microbes lay a foundation for manipulating the process of fermentation and for improving the overall quality of fermented products while retaining their traditional traits [23]. In order to have tractable model ecosystems, the microbial communities of fermented foods can be manipulated with selected or serial transfer microbes with microbial growth variables such as temperature, salinity, and moisture results to generate distinct microbial communities [25]. The safety of fermented food should be further discussed and the product specification and quality regulation should be established.

Cheaper Production

The production process of fermented foods for fruits and vegetables often requires longer time, which makes the production cost of good fermented foods high, resulting in excessive prices to obstruct its universalization. It is important to research shortening the fermentation process to reduce the cost in order to widely promote the fermented foods in public

Medical Herbal Plant Fermentation

Traditional Chinese medicine can improve the structure of gut microbiota by increasing probiotics and reducing pathogens for the prevention and treatment of diseases, including obesity and inflammation, insulin resistance, type 2 diabetes, non-alcoholic fatty liver disease, inflammatory bowel disease and other diseases [26]. Fructooligosaccharides (prebiotics) extracted from *Morinda officinalis* (OMO) are found to exert effective memory improvements in AD-like animals, by maintaining the diversity and stability of the microbial community [9]. It implies that the therapeutic effect of the traditional medicine, OMO, can improve the various neurological diseases such as AD. In China's folk usage, there have been long-term use of fermented Chinese herbal medicine to treat some ill diseases. At present, there are large-scale fermented products of Chinese herbal medicines or plants to be used in chronic diseases treatment in China, and have shown significant results. It is expected that there are more herbal plant ferments that will be involved in researches or clinical trials to solve unmet diseases.

Conclusion

Fermented foods can be functional foods for health care or disease prevention. Pharmaceutical-grade fermented food can be for ill diseases treatment. It is still waiting to solve the problems as confirm the safe and

beneficial microbiota as probiotics, shorten the fermentation process to reduce the production cost, raise scientific evidence for safety and effective use. In future, the herbal fermented products with regulatory classification may serve as a treatment or relief for many of the chronic diseases that are currently unsolved solution.

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