Probiotic Profiling and Organoleptic Evaluation of Traditional Cereal Based Fermented Drink and Its Market Potential

Kurapati Penchala Sai Raju*

Assistant Professor, Department of Information Technology, Dhanalakshmi Srinivasan College of Arts and Science for Women, Perambalur, Tamil Nadu

research@dscollege.ac.in

ABSTRACT

In recent years, the Indian food and beverage industry has undergone dramatic changes. Healthier alternatives to goods, including drinks specifically formulated to provide the human body with energy, nutrition and health, are becoming the top priority. Consumers have been pushed towards healthier drinks by the desire for wellness and concern for ill health. Fermented goods that are becoming extinct can be reinvented by introducing new mass manufacturing technology to meet the increasing demand for balanced drinks from customers. Consumers today favour food that encourages good health and avoids illnesses. In addition, these foods must fit into current lifestyles that include convenience, good taste, and an appropriate price value ratio for use. In the evolution of the food production cycle, certain foods represent present and future waves. In addition to maintaining conventional beverages, the production and marketing of fermented beverages will lead to a ready-to-consume robotic product for consumers readily available on the markets. Fermented food production was linked to the current research report, which sought to combine the possible health benefits of good bacteria with their ability to grow in cereals, resulting in a nutritionally balanced product that is ideal for consumers. It is a lactic fermented beverage based on indigenous natural cereal, historically from Maharashtra. The preparation method has remained a household art so far, which can lead to large variations in its final consistency and limited shelf life.

Keywords – *Organoleptic, Traditional, Market Potential*

INTRODUCTION

In recent years, the Indian food and beverage industry has undergone dramatic changes. Healthier products, including drinks specifically formulated to provide the human body with energy, nutrients and health, are becoming a top priority (Federation of Indian Chambers of Commerce & Industry, 2015). Consumers have been pushed into these drinks by the urge for wellness and concern for ill health. Healthier alternatives to goods, including drinks specifically formulated to provide the human body with energy, nutrition and health, are among the top

priorities. The customers for health drinks are people from the various walks of life but majority of them come from the younger and older generations. The increase in health-consciousness is also reflected in the growth in health care spending, which is rising from 5.5 percent of GDP in 2009 to 8 percent in 2012 at a compound annual growth rate (CAGR) of 14 percent. It is estimated that the figure will rise to US$ 280 billion by 2020. At the same time, the demand for balanced drinks is starting to gain momentum and volume. In the packaged beverage market, there is a massive opportunity fuelled by an increase in disposable incomes, evolving lifestyles and an increasing priority of the younger middle class (Federation of Indian Chambers of Commerce & Industry, 2015).

OBJECTIVES

1. To standardize the Ambils using four different cereals, buttermilk and FOS and study their sensory qualities

2. Development of cereal buttermilk based fermented beverage and studying its probiotic profile, organoleptic qualities, consumer acceptability and market potential

Health beverages in India

The availability of health drinks in Indian markets is still scarce, despite all the health knowledge among the population. The Indian beverage market is segmented according to the types of items that are carbonated and non-carbonated. Carbonated drinks make up about 61-62 percent of the overall demand for soft beverages. Pepsi, Coca Cola, Parle, etc. are the brands that fall into this grouping. The 36 percent non-carbonated category can be divided into 2 groups based on dairy products such as lassi, curd, flavored milk, buttermilk, etc. and fruit based on the types of flavors available such as orange, lime, lemon and mango, etc. The Indian non-carbonated beverage sector has become one of the fastest growing businesses currently valued at Rs 20,000 crore due to the trend of consumer health consciousness (FnB news, 2013). It is likely to increase by 35 percent at a healthy CAGR and cross 54,000 crore by 2018 (Associated Chambers of Commerce and Industry of India, 2013). According to the Euro Monitor International Report (2014), Indian customers are spending more and more on dietary supplements to fight the effects of health problems. This means that individuals are worried about their health. The substitution of carbonated beverages in the Indian market may be flavored milk, energy drinks, liquid-meal substitutes, weight-directed products, ready-to-drink meals and functional beverages. There is immense scope for the non-carbonated beverage industry for future innovations in India.

Consumption pattern of packaged beverages

Recent patterns in final demand for food suggest that the food paradigm has undergone a drastic transformation. Consumers are now well aware of their important role in health conservation, psycho-physical well-being and the prevention of certain diseases, in addition to the nutritional and sensory properties of food. Today, foods are not only meant to satisfy hunger and provide people with the requisite nutrients, but also to prevent nutrition-related diseases and enhance consumers' physical and mental well-being (Azzurra and Paola, 2009). Important functional food consumption predictors are linked to consumer motivation for wellness, perceived product diet efficacy, and nutrition awareness. There is evidence that the most likely consumers to have a

positive attitude towards functional foods are those who have experienced disease among relatives or have experienced disease on their own (Dowd and Burke, 2013). The functional food industry is rising rapidly worldwide, there is no doubt. However, successful commercialization of new products is difficult, particularly because of the need for a strategic approach to the processes of product production (Shamal et al, 2017). Increasing urbanization, rising knowledge and prosperity continued to encourage customers to make healthier choices and, thus, over the review period, gradually turn to packaged beverage milk products. The Compound Annual Growth Rate (CAGR) is projected to rise by 7 per cent in the coming years. Owing to urbanization, the shift in eating preferences and lifestyle behaviors has itself prompted health-conscious customers in today's modern world to look for an alternative treatment regime for different diseases caused by lifestyle-related diseases. Proboscis and probiotic-based food supplements have attracted consumer interest in this direction The ingestion of probiotics has a myriad of beneficial effects, as shown by thorough scientific assessment. Due to their promising health benefits and their applications, it is a major subject of attention for scientists around the world and provides a groundbreaking approach to the production of novel probiotic formulations (Bagchi, 2014). The proposed fermented beverage is an amendment to the conventional fermented beverage that has been used for ages in India. The commercialization of this drink would allow the entire population to have easy access to probiotics. The intake of this fermented drink will support all age groups and will lead to:

1. Improve bowel movement and aid digestion

2. Maintain balance of good and bad bacteria

3. Reduce toxins in our body

4. Help build the immune system (reduce risk of infections)

The goal of the technical implementation of the proposed fermented beverage is to combine the possible health benefits of good bacteria with their ability to grow in cereals, resulting in a nutritionally balanced, consumer-friendly product. The rising demand for customer convenience is another important reality. Consumers today favor foods that encourage good health and avoid illness. In addition, these foods must fit into current lifestyles that include convenience, good taste, and an appropriate price value ratio for use. In the evolution of the food production cycle, certain foods represent present and future waves. The production and promotion of this fermented beverage would not only maintain the conventional fermented beverage, but will also be ready for consumer use of the robotic product that is readily available in the markets.

INDIGENOUS FERMENTED FOODS

International status

For thousands of years, indigenous fermented foods have been prepared and eaten, and are closely connected to culture and tradition. Traditional fermented foods are obtained predominantly from milk products, i.e. Yoghurt, dahi, kefir, cheese (after long storage), and vegetable or vegetable juice fermentation, and fruit and berry juice fermentation. Japan, Korea, Indonesia, India, Nepal, and Sri Lanka are the most prominent countries among Asian countries consuming probiotics. There have been accounts in the literature of fermented foods such as

Kefir (Russia), Calpis (Japan), Tofu (Southeast Asia), Kimchi (Korea), Kaymak (Turkey) used for health benefits, which are characteristic of different societies (Tamang and Kailasapathy, 2010). Therefore, it is not surprising that fermented foods and beverages make a huge contribution to the diets of people around the world (Sanni, 1993). Fermented foods are estimated to contribute 20 to 40 percent of the food supply globally and typically a third of the food eaten by humans is fermented (Campbell-Platt, 1994). This makes fermented foods and drinks a big component of the diets of people globally.

National status

Fermented food and beverages prepared using local food crops and other biological tools have been ongoing since time immemorial in the Indian subcontinent and are still a common practise today (Roy et al., 2004). Idli, dosa, dhokla, khaman, handva, etc. are some common traditional fermented foods that are consumed in India, particularly in India's southern and western parts. A variety of fermented foods and beverages unique to the region are historically produced and consumed, and also sold locally in North-East India (Das and Deka, 2012). Sour buttermilk or yeast is added at some times in order to improve fermentation. A fermented soybean product is eaten in the eastern Himalayan regions of Darjeeling hills and Sikkim, Kinema (Nagai and Tamang, 2010). Fermented rice has been mixed in some parts of India with buttermilk and salt for direct consumption. In northern India, jalebies and kanji are primarily eaten (Sekar and Mariappam, 2007). Dahi, rabdi, paneer, shrikhand, misti dahi and chhurpi are used among the milk products in the northern, western, eastern and Himalayan regions of India, respectively (Nehal, 2013).

Importance of Fructooligosaccharide (FOS) as a prebiotic

FOS has been recognized for its great potential to increase bacterial bionomics, which could have a specific role in reducing the burden of CVDs, which is becoming apparent as a significant food factor. Several recent studies have shown that FOS intake decreases the incidence of CVDs by managing hypertension, enhancing glycemic regulation, lipid control, and reducing inflammatory marker expression FOS supplementation in pre-hypertensive type 2 NIDDM subjects has contributed to a substantial reduction of 6.3%, 9.8% and 10.6% respectively in Fasting Blood Sugar (FBS), Post-prandial blood glucose (PP2BS) and glycated hemoglobin. Another analysis with FOS added milk showed a substantial reduction of 5.2% and 7.8% respectively for FBS and PP2BS Studies have also shown substantial decreases in TG, TC, LDL-C, VLDL and increases in HDL-C with FOS intake (Sheth et al, 2015). In several studies, substantial reductions in ha-CRP levels and BMI have also been recorded (Sheth and Asudani, 2014; Jain and Sheth 2014). FOS is now being taken into account internationally and has tremendous promise for the future. New and creative products using FOS are now being produced by several foreign industries and organizations.

Probiotic foods are foods containing a single or mixed culture of micro-organisms that support the health of the consumer by enhancing their intestinal microbial equilibrium (Fuller, 1989, 1991). Probiotics aid with food and nutrient absorption and help the body's immune system by defending it against disease-causing pathogens. Some of their nutritional roles include the synthesis of vitamins (vitamin B and vitamin K) and the absorption of essential nutrients (calcium, magnesium and iron) by preventing harmful bacteria, viruses and other pathogens from

entering the bloodstream via the intestinal lining and stimulating the immune system by providing a defensive mechanism. Potential benefits can result from the bacteria's growth and action during the development of cultured foods (Kechagia, 2013).

Prophylaxis against certain forms of intestinal infection is also a preventive advantage (Mach, 2006), enhanced absorption of lactose against lactose maldigestion lactose-containing foods (Mach, 2006). The consumption of protein and calcium by lactose malabsorption can be impaired (Saikali et al. 2004) and these micro flora are able to offer multiple health benefits beyond basic nutritional value.

In the worldwide markets, most probiotic foods are milk-based and very few attempts are made to create probiotic foods using other fermentation substrates such as cereals. A big source of cheap calories and other nutrients worldwide is cereal based foods. Whole grains, including phytoestrogens, phenolic compounds, antioxidants, phytic acid, and sterols, are also sources of many photochemicals that make them essential in developing functional foods. Cereals contain resistant starch, water-soluble fibre (such as b-glucan and arabinoxylan), oligosaccharides (such as galacto-and fructo-oligosaccharides) and are therefore recommended to fulfil the prebiotic definition (Shah, 2001). In the presence of water and hydrolytic enzymes, cereal grains readily promote the growth of microorganisms, including lactic acid bacteria. Fermentation of lactic acid typically increases the nutritional value and digestibility of cereals.

Fermentation of various cereals, such as soya, sorghum, finger millet, with lactic acid has been found to be effective in reducing the amount of phytic acid, tannins and improving the digestibility of proteins. A significant component of the nutritional diet has long been fermented dairy products. The role(s) of probiotic bacteria in milk fermentation is to assist in: I preserving milk by producing lactic acid and possibly antimicrobial compounds; (ii) producing flavour compounds (e.g., yoghurt and cheese acetaldehyde) and other metabolites (e.g., extracellular polysaccharides and volatile compounds) which provide the product with organoleptic properties. Either sour cream or sweet cream buttermilk is obtained, depending on the conditions of manufacturing. Only a very small number of scientific studies on the use of buttermilk as a vehicle in probiotic cultures have been published. However, it can be presumed that buttermilk contains many species of beneficial microorganisms that rely on the particular cultures used in the dairy industry for the production of butter.

It is important to achieve the determination of these microbes. Leroy and Vuvst confirmed that Lactococcuslactissubsp. 2004 Cremorisis is a buttermilk-related lactic acid bacterium. The probiotic genera most commonly used in the food industry are Lactobacillus and Bifid bacteria. It is estimated that more than 70 products containing Lactobacillus acidophilus and Bifid bacterium subsp. are manufactured worldwide, including yoghurt, buttermilk, frozen desserts and milk powder (Shah 2007) With this context, the present study was designed to use cereal grains and millets such as rice, barley, pearl millet, finger millet and buttermilk to establish a fermen milk-based fermen milk.

The proposed fermented beverage is an amendment to the conventional fermented beverage that has been used for ages in India. The commercialization of this drink would allow the entire population to have easy access to robotics. Consumption of this fermented drink will be beneficial for all age groups and will help to: enhance bowel movement and digestion support,

maintain equilibrium between good and bad bacteria, reduce contaminants in our body and help develop the immune system (reduce risk of infections) The technical implementation of the proposed fermented drink aims to combine the potential health benefits of good bacteria. The rising demand for customer convenience is another important reality. Consumers today favour foods that encourage good health and avoid illness. In addition, these foods must fit into current lifestyles that include convenience, good taste, and an appropriate price value ratio for use. In the evolution of the food production cycle, certain foods represent present and future waves. The production and promotion of this fermented beverage would not only maintain the conventional fermented beverage, but will also be ready for consumer use of the probiotic product that is readily available in the markets.

CONCLUSION

In recent years, the Indian food and beverage industry has undergone dramatic changes. Healthier alternatives to goods, including drinks specifically formulated to provide the human body with energy, nutrition and health, are becoming the top priority. Consumers have been pushed into these drinks by the urge for wellness and concern for ill health. Healthier alternatives to goods, including drinks specifically formulated to provide the human body with energy, nutrition and health, are among the top priorities. Fermented goods that are becoming extinct can be reinvented by introducing new mass manufacturing technology to meet the increasing demand for balanced drinks from customers. Consumers today favour foods that encourage good health and avoid illness. In addition, these foods must fit into current lifestyles that include convenience, good taste, and an appropriate price value ratio for use. In the evolution of the food production cycle, certain foods represent present and future waves. In addition to retaining the traditional fermented beverage, the production and promotion of this fermented beverage would also be a ready-to-eat robotic commodity for customers readily available on the markets.

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