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Milk based functional drinks- A review

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Abstract

Milk has always been a choice of innovation for food researchers to meet the ever changing consumer's preferences for newness in the products. Moreover, milk is consumed by people of all age can act as potent carrier for the herbs which can add functional attributes to the product. In modern era consumers are very much aware about their health. So the demand of functional foods is increasing day by day at global level and more and more people are adopting functional foods for health benefits. The flavored herbal milk drinks contains calcium, phosphorus, iron and other essential nutrients, which makes it a potential food supplement for adults and children. It is concluded that herbal milk drinks are proven to be beneficial under various conditions, such as anaemia, diabetes, cancer, eczema, constipation, support healthy skin, kidney swelling and common cold.

Keywords: Milk, herbal plants, medicinal, functional drinks.

Introduction

Throughout human history, plants have played a key role in treating human diseases. In thousands of years of trials, human found many plants which are good for treating ailments and curing serious health problems like cancer, diabetes and atherosclerosis. Modern science has already accepted the potential of herbs as a source of new bio-active constituents. They are a kind of alternative medicine that is inexpensive and has no side effects. For example: wheatgrass, barley grass, mint, aloe vera, curcumin, garlic, ginger, grapefruit, green tea. Wheatgrass (*Triticum aestivum*,) has been an integral part of Indian culture for thousands of years and has been known to have remarkable healing properties [1]. Chlorophyll present in wheatgrass can protect from carcinogens it strengthens the cells, increases the function of heart, detoxifies the liver and blood stream, and chemically neutralizes the polluting elements [2]. Taking all these factors into consideration, we can certainly state that the herbal plants are safe with no side adverse effects, and is palatable and full of benevolent properties.

Forty per cent of Indian population is below the age 18 years and less than half of Indian children are school going children between age 6 and 14. More than 50 per cent of Indian children are malnourished; one in every five adolescent boys and every two adolescent girls in India are undernourished. More than one in three women in India and more than 60 per cent children in India are reported anaemic. Anaemia prevalence in young children continues to remain over 70 per cent in most parts of India [3].

In modern era consumers are very much aware about their health. So the demand of functional foods is increasing day by day at a global level [4]. Milk has always been a choice of innovation for food researchers to meet the ever changing consumer's preferences for newness in the products. Moreover, milk is consumed by people of all age can act as potent carrier for the herbs which can add functional attributes to the product and consumers well being. Nowadays, more and more people are adopting herbal way of life for their health benefits. There is also a need to find diverse technologies to add value to milk and its by-products [5]. The Herbal milk represents a great in-between meal and medicine. The flavored Herbal milk contains calcium, phosphorus, iron and other essential nutrients, which makes it a potential food supplement for adults and children. It can be flavored with different herbal plants to change the medicinal properties [6].

Development of different milk based drink:

Grewal and Jain [7] developed a standardized procedure for manufacturing of carrot juice based milk beverage. Beverage was prepared by blending 20 per cent carrot juice with skim milk, 0.8 per cent sugar and 0.6 per cent salt. The product was sterilized at 116 °C. Boomgard *et al.* [8] made a chocolate milk beverage by making a blend of cocoa powder, sucrose, carrageenan and

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then mixing the reconstituted skim milk at 50 °C. This mix was homogenized at 75 °C and heat treated at 135 °C for 10 seconds.

Lenkov ^[9] described the manufacturing of new dietetic milk drink "Eliskir". It is manufactured from milk with the addition of fruit syrup, medicinal herbs and vitamins and is considered to be suitable for all age groups suffering from variety of disorders. A 'Golden milk shake' has been prepared from a blend (4.5 per cent fat) of cow milk and safflower milk utilizing 3.0 per cent safflower petal extract and orange flavour (0.5 ml/lit.), 10.0 per cent sugar and 0.4 per cent sodium alginate as stabilizer by Kashid *et al.* ^[10]. Such milk shake prepared from a blend of cow milk and safflower milk (1:1 w/w) was recommended.

Composition of milk based beverages

Proffit and Moore ^[11] developed a milk grapefruit juice drink having formulation 56.8 per cent milk, 38 per cent grapefruit, 5 per cent sugar and 0.2 per cent stabilizer. Kalesnikova *et al.* ^[12] developed a carrot flavoured drink, which contains 66 per cent total solids, 6 per cent protein, 50 per cent carbohydrates, 2.84 per cent minerals and vitamins.

Kumar and Muley ^[13] prepared a chocolate milk beverage by using double toned milk which contains 1.5 per cent milk fat, 0.9 per cent MSNF, 6 per cent sugar, 1.5 per cent cocoa powder and 0.2 per cent stabilizer.

Gutknecht ^[14] developed skim milk based fruit juice beverage consisting of 85 per cent skim milk and 15 per cent orange juice. Ibrahim *et al.* ^[15] added Buffalo skim milk with 10.0 per cent guava pulp and 4.0 per cent sugar yielded acceptable pasteurized beverage; use of 0.05 per cent carrageenan was necessary for preparing sterilized guava beverage. The pH of guava pulp was 4.4 which decreased the pH of beverage to 6.4. Singh *et al.* ^[16] Blended Buffalo or cow skim milk with carrot juice (7.0 per cent TS) and added with 8.0 per cent sugar and 0.2 per cent gelatin to prepare a nutritious beverage; levels above 20.0 per cent carrot juice incorporation resulted in sedimentation.

Sensory characteristics of flavoured milk drink by adding juices.

Dubey *et al.* ^[17] made an attempt to incorporate herbs in milk. In his experimental herbal flavoured sterilized milk coded as T₁, T₂ and T₃ from double toned milk with the addition of sugar and honey in the ratio 1:1, 2:3, 1:2, herbal extract (10 per cent, 15 per cent, 20 per cent), *kesar* flavor (1, 1.5, 2) ml/l, colour (0.4, 0.6, 0.8) g/l and stabilizer (0.2 per cent, 0.3 per cent, 0.4 per cent). T₀ represented the control with the addition of 8 per cent sugar, 0.5 ml/l flavour, 0.2 g/l colour and no honey, herbal extract and stabilizer. It was therefore, concluded that the treatment T₁ (1:1 sugar honey ratio, 10 per cent herbal extract, 1 ml/l *kesar* flavor, 0.4 g/l colour and 0.2 per cent stabilizer) was at par with the control in terms of organoleptic and physico-chemical attributes and concluded that his product has good palatability and can be of great importance as a general health drink as it can be consumed to lower the blood sugar and cholesterol level.

Ramasamy *et al.* ^[18] studied the colour, flavour, acceptability of sterilized flavoured cow and buffalo milk prepared with extracts of beetroot (2 per cent), carrot (5 per cent) and *Stevia* sp. (2 per cent) separately, and also in combination with cardamoms (0.2 per cent) and with instant coffee powder also studied. It was shown that flavoured milk prepared from carrot juice with cardamom powder retained its colour and

flavour, and was more acceptable, followed by flavoured milk prepared from instant coffee powder.

Ramasamy *et al.* ^[19] standardized the preparation of sterilized flavoured milk enriched with 5, 7.5, 10 and 12.5 per cent levels of carrot juice with 0.1 per cent cardamom and 10 per cent sugar was studied for their sensory acceptance. The expert panel rejected the 12.5 per cent enrichment which had lowest sensory acceptance. Sterilized flavoured milk enriched with 5 per cent, 7.5 per cent and 10 per cent carrot juice of 200 ml servings were found suitable for satisfying the RDA for β-carotene to children, adult men/women and pregnant woman respectively. Ibrahim *et al.* ^[20] standardized 1.0 per cent fat milk added with 20.0 per cent mango pulp, 2.0 per cent sugar and 1.0 per cent of total milk protein powder yielded a highly acceptable mango milk beverage.

Palthur *et al.* ^[21] added *Ocimum sanctum* extract with milk and found that prepared herbal milk was good for overall acceptability scores. Palthur *et al.* ^[22] prepared Ginger flavoured herbal milk by addition of ginger extract with milk and concluded that overall acceptability of the ginger flavoured herbal milk was found to be good and recommended for market exploration. Pugazhenthii and Jothilingam ^[5] prepared herbal flavoured milk by incorporating Aloe vera pulp extract at different concentrations viz. 3, 5 and 7 per cent. Based on the sensory evaluation, herbal flavoured milk with 5 per cent Aloe vera pulp extract was found to be the best.

Storage and keeping quality of milk drink

Gutknecht ^[14] discovered that when milk and other fruit juices were processed at very high temperature, it makes the beverage shelf stable without refrigeration for six months to one year. Rahman *et al.* ^[23] produced banana flavoured milk beverage and observed its shelf life to be 28 days, when bottled and stored at 4-5 °C.

Microbial study of milk drink

Wheeler and Gillies ^[24] developed banana milk by mixing banana and whole/partially skimmed milk. The storage studies indicated that bacteria number c.f.u./ml as shown by total plate count increase steadily. More count was observed at 10 °C as compared to 5 °C. Hassan and Ahmed ^[25] conducted a study to develop a mango –milk beverage and the product was analyzed organoleptically and microbiologically at 3 month intervals during 6 months of storage at ambient temperature. Acceptability of all blends was good and microbiological quality was maintained during storage at ambient temperature. Jayalalitha *et al.* ^[26] prepared Biofevita novel milk based biobeverage by incorporating beetroot juice (1per cent), carrot juice (5per cent) and dates extract (2 per cent) into whole cow milk as prepared. It was bottled sterilized and the shelf life of the Biofevita was three months without refrigeration.

Conclusion

People all over the world are becoming more health conscious; besides taking regular exercises they pay more attention to what they eat in order to maintain a healthy body. As a result, milk based functional products, in the form of food supplements and health drinks, have gained increasing popularity among consumers of all ages. Many herbal plants have been an integral part of Indian culture for thousands of years and have been known for their ability to, improve insomnia, increase strength, naturally regulate blood pressure

and blood sugar, support weight loss, improve digestion, improve the function of our heart-lungs and is beneficial in arthritis and muscle cramping. This fact has led to an increase in consumers' interest in functional foods. Dairy products occupy a significant space in the functional foods market and dairy-based functional beverages are a growing segment of this sector.

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