

## Synbiotic Fruit Yoghurt with Enhanced Functionality

Editorial

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Recent societal interest in healthful foods has led to the development of functional dairy products that basically provide health benefits in addition to their fundamental nutrients. Amongst diverse fermented milk products, yoghurt is most popular due to its functional attributes [1, 9] coupled with its general positive image among consumers. Yoghurt is considered as the most suitable probiotic carrier and inclusion of probiotic cultures in yoghurt is suggested to extend the functional properties of normal yoghurt [22]. Further, dietetic value of yoghurt can be enriched with the inclusion of fruits or prebiotic [8, 20].

Fruit juices may be a better carrier than milk for probiotic [24] and fermented milks incorporated with fruit matrices may be an alternative dairy product to deliver probiotic bacteria [4]. It has been reported that yogurt containing fruit could provide probiotics, prebiotics, high-quality protein, important fatty acids and a mixture of vitamins and minerals that have the potential to exert synergistic health effects. Beneficial synergistic relation between fruit and probiotic bacteria suggest their incorporation in yoghurt resulting in new era in functional food innovations [23].

Honey is basically a supersaturated solution of fructose and glucose [14] and contains minor components such as phenolic acids and flavonoids, enzymes glucose oxidase and catalase, ascorbic acid, carotenoids, organic acids, amino acids, proteins and  $\alpha$ -tocopherol [11]. Honey exhibits both bacteriostatic and bactericidal effects against gram-positive bacteria [6] and the antibacterial activity is attributed to both peroxide and non peroxide substances. Honey can be safely used as an alternative treatment for clinical conditions such as cardiovascular diseases, chemo-preventive activity in multistage carcinogenesis, improving endothelial function and plasma lipid profile [2], antimutagenic, antiproliferative, hepatoprotective, hypoglycemic, antioxidant [10, 13] human pathogen control, antiviral activity [16], treatment of wounds or stomach ulcers [12].

Honey may contain more than twenty oligosaccharides [25] and its spectrum varies with the type of honey [19]. Oligosaccharides such as isomaltose, melezitose [26] and raffinose [18], present in

honey have been reported to be responsible for growth stimulating of bifidobacteria [15]. Oligosaccharides from honey can be utilized to yield beneficial metabolites that promote the prebiotic effect by selectively modulating the gut microbial balance in favour of probiotic lactobacilli and bifidobacteria, thus improving the host metabolic function [17]. Research revealed highest stimulatory effect of honey for both *Lactobacillus delbrueckii* subsp. *bulgarius* ( $230 \times 10^6$  cfu/g) and *Streptococcus thermophilus* ( $395 \times 10^6$  cfu/g) [21]. Further, viable populations of probiotics such as *Lactobacillus acidophilus* [5] and Bifidobacteria encountered in bioyoghurt containing honey was within the range required for exhibiting health effects [3]. Retention of viability of probiotic bacteria such as *Lactobacillus acidophilus* LA-5 and *Bifidobacterium* BB-12 in bioyogurt containing honey at a level of  $10^7$  cfu/g upto 35 days of storage at 2-4°C was noted [7].

Conjugated application of probiotics, honey and fruits are recommended for the manufacture of synbiotic fruit yoghurt with enhanced functional attributes.

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Received: January 30, 2019

Published: January 31, 2019

Citation: S Sarkar. Synbiotic Fruit Yoghurt with Enhanced Functionality. *Int J Food Sci Nutr Diet.* 2019;8(1e):1-2.

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