Chemical composition of water buffalo milk and its low-fat symbiotic yogurt development

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ABSTRACT

Background: Water buffalos are the second most widely available milk source in countries around the world. While typical average milk compositions are readily available, information on seasonal variation in chemical composition of buffalo milk is limited -especially in the Northeastern region of the United States. Data collected in this study can be useful for the manufacture of a wide variety of specialty dairy products such as symbiotic buffalo milk yogurt. To analyze functionality, symbiotic low fat buffalo milk yogurt prototypes (plain and blueberry) were developed using a commercial starter containing probiotics.

Methods: During a one-year cycle, physicochemical and mineral contents of buffalo milk were analyzed. Prototype yogurts were manufactured commercially and samples of the yogurt prototypes were analyzed for physicochemical and microbiological properties and for the survivability of probiotics during ten weeks of storage.

Results: Average contents of total solids, fat, lactose, crude protein, ash, specific gravity, and conjugated linoleic acid in the milk ranged from 16.39-18.48%, 6.57-7.97%, 4.49-4.73%, 4.59-5.37%, 0.91-0.92%, 1.0317-1.0380%, and 4.4-7.6 mg/g fat, respectively. The average mineral contents of calcium, phosphorous, potassium, magnesium, sodium, and zinc in the milk were 1798.89, 1216.76, 843.72, 337.20 and 7.48 mg/kg, respectively, and remained steady throughout the year. The symbiotic low fat buffalo milk yogurts evaluated in this study contained higher amounts of protein, carbohydrates, and calcium than similar yogurts manufactured with cows’ milk. During refrigerated storage, the probiotic Lactobacillus acidophilus was viable (>1×10⁶ CFU/g) for the first two weeks, while Bifidobacterium spp.
and *Lactobacillus casei* remained viable during the entire ten weeks. Reducing the acidity and enhancing the flavor of the yogurts could improve the overall acceptability.

**Conclusion:** The results indicated that the low fat buffalo milk yogurt are a rich source of nutrients and are nutritionally preferable to cows’ milk yogurts. The shelf life analysis indicated it to be a good vehicle for developing symbiotic yogurt.

**Keywords:** Buffalo milk, conjugated linoleic acid, symbiotic yogurt, probiotic survivability, physicochemical properties, acceptability.