

# Camel Dairy Products –The Potentially Healthy Foods

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**Abstract:** Camel milk has been identified as a potential nutritional and therapeutic food source in a number of arid and semi-arid regions. Camel milk is similar to cow milk in composition, with predominant medium-chain fatty acids in fat, low lactose, and abundant vitamin C and iron. Camel milk is currently processed into a variety of fermented and non-fermented products; however, major commercially important products processed from bovine milk (yoghurt and cheese) have yet to be successfully processed from camel milk. High-quality nutritionally valuable fermented dairy cereal product made from fermented camel milk and quinoa with probiotic culture. Quinoa-camel milk kishk is a good source of protein for children, adults, the elderly, and patients, as well as minerals and other nutritive nutrients and systems. Camel milk could be replaced with Oat milk until 40% as a source of bioactive components and dietary fibre in the manufacture of probiotic camel stirred milk yoghurt. A synbiotic camel milk ice cream formulated with black rice powder was created, which improved the physicochemical and rheological properties of ice cream samples while also having a significant protective effect on probiotic bacteria viability.

**Keywords:** Camel milk, Ice cream, kishk, yoghurt.

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## 1. Introduction

Camel milk has long been used in many countries around the world to treat various health issues. Fermented camel milk has been shown to have some health benefits, such as hypocholesterolaemic effect, antimicrobial activity, antioxidant activity, angiotensin converting enzyme (ACE) inhibitory activity, activity against diarrhoea, and anticancer activity (Solanki and Hati, 2018).

Camel milk differs from cow's milk in that it contains immune proteins such as lysozyme, an antioxidant, anti-inflammatory, immunoglobulins, with no beta-lactoglobulin, which may cause allergic reactions in some people, and a high amount of vitamin C, iron, potassium, and vitamin E, A. (Salem *et al.*, 2017; Khalesi *et al.*, 2017). Camel milk contains less casein, a lower ratio of beta-casein to kappa-casein, a lower percentage of  $\alpha$ -s casein, more whey protein, and antimicrobial components such as lysozyme,

lactoferrin, and immunoglobulins than bovine or buffalo milk (Agrawalet *al.*, 2007). All of these factors influence the technological properties of heat treatment and acid or enzymatic coagulation of camel's milk (to make it almost semi-liquid) (Omar *et al.*, 2019).

## 2. Ice cream

Camel milk has gained popularity among customers in recent years due to its therapeutic properties. It is regarded as one of the primary components of human nutrition in many parts of the world. The purpose of this study was to create a novel synbiotic ice cream made from camel milk and black rice powder (BRP), as well as to investigate the viability of probiotic bacteria (*Lactobacillus acidophilus* LA-5) during storage (60 days). BRP replaced skim milk powder at levels of 0, 25, 50, and 75%. The ice cream was tested for physicochemical, rheological, microbiological, and sensorial properties. The results showed that

incorporating BRP into ice cream blends increased the overrun, viscosity, and melting resistance of ice cream samples significantly ( $p < 0.05$ ). However, as the proportion of BRP in the blend increased, so did the freezing point. The sensory evaluation results revealed that the most acceptable treatments were those formulated with 25% BRP and could be increased to 50% with no significant differences. Over 60 days of storage, the incorporation of BRP improved the viability of *Lactobacillus acidophilus* LA-5 in ice cream samples (Elkot *et al.*, 2022).

### 3. Yoghurt

The effect of replacing camel's milk with Oat milk on the physicochemical, rheological, microbiological, antioxidant, and sensory properties of probiotic stirred camel milk yoghurt during storage was studied. Stirred yoghurt made from camel milk served as a control, and the other treatments were made from camel milk after replacing 10, 20, 30, and 40% of it with Oat milk. Results revealed that partial replacement of camel's milk with Oat milk was more effective in increasing total solids, protein, ash, total carbohydrates, acidity and total volatile fatty acid (TVFA), viscosity, phenolic content, and antioxidant activity, and these increments were proportional to camel's milk. The viability of *Streptococcus thermophilus*, *Lactobacillus acidophilus*, and *Bifidobacterium bifidum* was increased proportionally to the replacement ratio when camel milk was partially replaced with Oat milk. The study concluded that replacement up to 40% improved the physicochemical, rheological, microbiological antioxidant and senescence properties (Atwaa *et al.*, 2020).

### 4. Kishk

This research aims to create a high nutritive value blended fermented milk and cereals, as well as ready-to-eat functional foods made from camel milk and quinoa seeds. Kishk is an artisanal popular product in Egypt and the Middle East; however, no research has used quinoa to make kishk. This study includes five formulations as well as a control. The findings revealed that using quinoa seeds in the preparation of kishk significantly increased protein content (22.01 1.0 and 21.10 1.0) in both camel milk quinoakishk and cow milk quinoakishk. The iron content of camel milk quinoa-wheat kishk T3 was the highest (53.1 mg/L). The probiotic bacteria level in all samples was maintained during storage. Coliform, yeasts, and moulds were not found in any of the treatments. Kishk made with quinoa and camel milk has a high biological value and a long shelf life (AbdRabou *et al.*, 2020).

### 5. Conclusion

In a recent study, camel milk was shown to have nutritional and therapeutic value due to its low fat and cholesterol levels, as well as a significant amount of antimicrobial peptides. Due to the high concentration of nutrients and bioactive elements in camel milk, the global market for camel milk and camel milk products is rapidly expanding. Scientists should look into ways to overcome the challenges that arise during the manufacturing of camel dairy products, as processing camel milk into various products could be regarded as a means of preservation. Furthermore, extensive research on the therapeutic effects of camel milk on human patients is required, as are strict international regulations to prevent adulteration of this valuable product.

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