



Possibilities of Camel Milk Cheese Making

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ABSTRACT

The current work is mainly done to assess the current research out puts on camel milk cheese making technology. Camel milk is an important component of the human as contains all essential nutrients. Camel milk in terms gross composition of comparable to bovine milk but differs in its protein composition as it lacks β -lactoglobulin (β -Lg), has small amount of κ -casein (κ -CN) and larger amount of β -casein (β -CN) in its casein micelles. Dairy products like cheese and yogurt production from camel have difficulty. Due to its slower coagulation property, lower yield and weak curd structure. Through time different trials were done to make cheese from camel milk using different method or parameter, ingredient, cultures, milk coagulant.

Keywords: Camel, Milk, Cheese

INTRODUCTION

Camels are a multipurpose that provide milk, meat, wool, used for transport, tourism and draft power especially milk production is principal. Camel knows with two species *Camelus bactrianus* and *Camelus dromedarius* (Faye, 2015). Camels (*Camelus dromedarius*) have unique adaptability to the harsh climatic conditions. Milk of camel is an important component of the human as contains all essential nutrients (Algamy, 2000, 2009). Camel milk in terms gross composition of comparable to bovine milk but differs in its protein composition as it lacks β -lactoglobulin (β -Lg), has small amount of κ -casein (κ -CN) and larger amount of β -casein (β -CN) in its casein micelles. As literature indicates that camel have therapeuti anti-diabetic properties, control high blood pressure, no allergens since it close to mothers' milk due to lack whey protein bet lactoglobuline which lead future opportunity for application infant food. Pastoralist believed it as treatment of Jaundice, Malaria, Constipation, to clear the stomach, post-partum care of women, to detoxify snake venom and flatulence (Eyassu, 2007) [1].

Predominantly camel milk is consumed in raw form and sometime traditionally fermented form (Ipsen,

2017; Konuspaveva and Faye, 2021). Fermented camel milk product traditionally known as 'dhanaan' in Ethiopia 'Garris' in Sudan, 'shubat' in kazakhstan and 'sussa' in Somali traditionally known. However; Dairy products like cheese and yogurt production from camel have difficulty. During cheese making it shows slower coagulation property (Salihal et al, 2011; Konuspaveva, 2013; Aleme and Mohammed, 2014; Konuspaveva and Faye, 2021), lower yield and weak curd structure. This is due to the peculiar properties of camel milk; a lower κ -casein content, brooder casein micelles and lower total solid content. As literature indicates Casein micelle size range between 154- 230 nm in bovine milk while in camel milk it range 260-300 nm (Farah, 1993) [2].

Indicators of cheese making from camel milk

Through time different trials were done to make cheese from camel milk. Fresh soft white cheese can be made from camel milk using different parameter such as mixing with milk of cow, buffalo, lowering pH, adding calcium chloride. Using different coagulant; for instance Soft unripe cheese can be made from camel milk by using plant origin. Using of new transgenic coagulating enzyme called camel chymosin (Chy-Max M) that resulted

markedly improvement on curd formation camel milk cheese. Similarly Soft type cheese (halloumi and feta) using camel chymosin also reported [3-5].

According to using lemon juice as coagulant to manufacture Soft cheese reported to improved cheese yield, shelf life and overall sensory acceptability. Similarly evaluation on enzyme extracts from pineapple, kiwi, and ginger as coagulate on camel milk cheese making according the authors result kiwi proteases exhibit commercial chymosin like properties which assumed to have potential for use as a milk coagulant in cheese production. Plant origin milk coagulant *Calotropis procera* (Sodom apple), *Cynara* sp, *Moringa oleifera* flowers. On the other hand species such as *Solanum incanum*, *Ficus carica* and *Rhus natalensis* were known to have milk coagulating properties by the societies traditionally in northern parts of Ethiopia [5-7].

Cheese making from camel milk by lowering milk pH and addition of calcium chloride before rennet make κ -casein available for rennet enzyme action. Mixing of buffalo milk with camel milk decreases rennet coagulation time but increases the clotting time because of addition in casein content improved the rennetability and cured properties [8-14]. Similarly good fresh soft white cheese "Jibna-beida" can be produced by mixing camel and cow milk, lowering the pH of milk and addition of calcium chloride prior to rennet addition. Production pre-ripened provolone cheese making from blends of cow, doe, ewe and camel milk well studied and recommended as optional technology [14-25]. According to authors statements sample with (60% cow, 10% doe, 10% ewe and 20% camel milk) is better in mineral, vitamin C and total polyphenols content [26-28].

DISCUSSION

The experiment that evaluate effect of starter cultures on soft white cheese from camel milk taking into account curd firmness, cheese yield, compositional quality and textures using of ST1-12, RST-743 and R-707 cultures recommended to be better for the manufacture of camel milk in.

CONCLUSION

Making cheese and yogurt production from camel have difficulty due to its slower coagulation property, lower yield and weak curd structure. Through time different trials were done to make cheese from camel milk using different method or parameter, ingredient, cultures, milk coagulant. Soft cheese is most tried by different authors with different parameters

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