STUDIES ON RICOTTA CHEESE MANUFACTURE FROM PARTIALLY SKIMMED BUFFALO MILK

By

FATMA HUSSIEN ABDEL-RAZIK MOHAMMED

B.Sc. Agric. Sc., (Dairy Sc. & Tech.), Cairo University, 2002

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ABSTRACT

Fatma Hussien Abdel-Razik Mohammed: Studies on Ricotta Cheese Manufacture from Partially Skimmed Buffalo Milk. Unpublished M.Sc., Thesis, Department of Food Science, Faculty of Agriculture, Ain Shams University, 2016.

The goals of this investigation were to improve the lack in quality properties of Ricotta cheese through the use of fresh skim milk and whey protein concentrate powder (WPCP) to improve the yield of cheese, and addition potassium sorbate and some herbs to improve the cheese shelf life, while fortification Ricotta cheese with different fruit pulp amid to enhance the sensory and nutritional values of these product. The study was conducted in three parts, the first part; different Ricotta cheese treatments made from Mozzarella cheese whey and reconstituted WPCP supplemented with fresh buffalo's skim milk (FBSM). Control Ricotta cheese was made from fresh Mozzarella cheese whey supplemented with 10% FBSM and T1 Ricotta cheese were made from fresh Mozzarella cheese and FBSM (1:1). T2, T3 and T4 Ricotta cheese treatments were made from reconstituted WPCP 2, 4, 6 % and FBSM (1:1), respectively. The results indicated that, there were significant differences in the dry matter, protein and acidity contents among all treatments. Increasing fresh buffalo's skim milk and WPCP in Ricotta cheese mixture caused significantly increase in dry matter, protein and ash contents in resultant cheese product, and non significant effect in acidity % and pH values compared with control Ricotta cheese. There were significant differences in the loss of protein and protein recovery among all treatments. Increasing the amount of fresh skim milk and WPCP in Ricotta cheese treatment caused significant increase in protein recovery, cheese yield and significant decrease in loss of protein in Ricotta cheese. Coliform and spore form were not detected in either fresh control or treatment cheese samples. Sensory evaluation results showed that there were significant differences among the Ricotta cheese samples. The highest flavour and

total scores points were gained by T2 Ricotta cheese made from 2% reconstituted WPCP+ FBSM (1:1) The sensory scores of all Ricotta cheese samples and yield value were decreased, while dry matter, protein, ash and acidity contents were slightly increased in all the Ricotta cheese samples as the refrigerated storage period progressed up to 15 days. It could be recommended that, Ricotta cheese can be produced with good quality and acceptability using reconstituted WPCP. The final product exhibited high yield, improved body and texture and better cheese flavour. Ricotta cheese made from 2% reconstituted WPCP+ FBSM (1:1) was the best treatment among all cheeses.

In the second part, Ricotta cheese was manufactured from 2% reconstituted WPCP mixed with fresh buffalo's skim milk (1:1). Potassium sorbate was added as preservative at a rate of 0.015 % (w/v) for manufacture Ricotta cheese (T1). Ricotta cheese treatments (T2 and T3) fortified with 1% *Nigella sativa* and *Thymus valgarius* as herb respectively. Control Ricotta cheese (without any additive) were also prepared. The results revealed that, addition of potassium sorbate as preservative in Ricotta cheese manufacture had no effect on physiochemical properties and sensory evaluation in fresh resultant Ricotta cheese. While, had a significant effect on microbiological quality of Ricotta cheese. Fortification the Ricotta cheese cured with different herbs caused a significant increase in dry matter and ash contents compared with control cheese. While, there were no significant differences in the yield value, protein content and titratable acidity contents among all treatment. Coliform and spore form bacteria were not detected in either fresh control or treatment cheese samples and during the refrigerated storage. Fortification the Ricotta cheese with some herbs enhanced the flavour and total scores in resultant cheese. Generally, the titratable acidity (%), dry matter, protein and ash contents gradually slight increased in all treatments and control samples during the storage period. The yield value and sensory scores of all Ricotta cheese treatment were decreased during storage period. It could be recommended that, addition

of potassium sorbate as preservative in Ricotta cheese manufacture could be improved the microbiological quality and the shelf life in resultant product. It could be produced a new herby Ricotta cheese with acceptability using some herbs such as thyme (*Thymus valgaris*) and black cumin (*Nigella sativa*) and more suitable for the Egyptian consumer.

In the third part, new type of flavoured Ricotta cheese fortified with different fruit pulps (Zibdiaa mango, guava and Amhate dates) and control Ricotta (without fruit additive) were prepared and stored up to 25 days at 5^{o}C. The fruit pulps were added at the rate of 15% w/w. Significant differences could be observed in pH value, dry matter, protein, ash and acidity (%) in control and all treatments. Addition of fruit pulps during Ricotta cheese production caused significant increase in the yield values, crude fibers, some minerals (K and Fe) and vitamins (A, B_1 and B_2) contents compared with control Ricotta cheese. Total bacterial, yeast and mould counts were higher in fruit cheese samples compared with control cheese and increased significantly during storage at 5^{o}C. Fortification of different fruit pulp in Ricotta cheese manufacture enhanced total score points of the resultant cheese. Storage of different Ricotta cheese samples at 5^{o}C lowered the yield, pH values and sensory quality, while dry matter, protein, ash and acidity (%) contents increased. It could be concluded that, different fruits pulp (Zibdiaa mango, guava and Amhate dates) could be used as good source of dietary fibers and minerals for making new type flavoured Ricotta cheese for enhancing sensory, nutritional and functional values of this new product.

Key Words: Ricotta cheese, shelf life, yield, fruit pulp, fortification and sensory quality

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