

Standardizing the processing parameters for Mozzarella cheese making from partially homogenized milk

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Objective

Homogenization of milk is beneficial in manufacture of Mozzarella cheese destined for pizza applications with regard to appearance, flavour, yield and reduced fat leakage during baking. However, homogenization has some adverse effect on cheese making and resultant cheese quality. Hence, partial homogenization of milk was tried out which has lower adverse influence on cheese making properties.

Methodology

It was decided to go for partial homogenization (25 +10 (P₁) and 50 + 10 (P₂) kg/cm² pressure at 60°C) of milk (mixed – cow plus buffalo), which entails homogenizing low-fat cream (25% fat) and mixing it with unhomogenized skim milk to obtain standardized cheese milk (3.0% fat, 3.15% protein). Control Mozzarella cheese was prepared from unhomogenized milk. The manufacturing parameters that were standardized were: (i) addition of calcium chloride to cheese milk, (ii) optimizing the cooking temperature during cheese making, (iii) optimizing the whey acidity at draining during cheese making, and (iv) optimizing the conditions of plasticizing the Mozzarella cheese curd.

Result and Discussion

Good quality Mozzarella cheese, suitable as a pizza topping could be obtained through use of (i) 0.01% of CaCl₂ to cheese milk vs. no addition to control milk, (ii) cooking the cheese curd to a final temperature of 44°C vs. 42°C for control), (iii) draining of whey at whey acidity of 0.45 and 0.49% LA when adopting pressures of P₁ and P₂ respectively vs. 0.42% LA for control, (iv) adopting plasticizing treatment to cheese curd through use of moulding water temperature of 95°C for 3-4 min and 95°C for 2-3 min vs. 99°C for 3-4 min for control. The yield of Mozzarella cheese obtained for experimental (employing pressures P₁ and P₂) and control were 11.05 and 11.18 and 10.20% respectively.

Conclusion

The standardized process of preparing Mozzarella cheese from partially homogenized milk with enhanced cheese yield comprise of (a) use of calcium additive to firm the rennet curd, (b) cook the cheese curd to higher temperature to increase syneresis, (c) adopt higher whey acidity at draining to obtain stretch property and (d) adopt milder plasticizing treatment to cheese curd to minimize adverse effect on cheese curd.

