EFFECTS OF SOMATIC CELL COUNTS IN COW MILK ON THE PHYSICAL AND CHEMICAL PROPERTIES OF YOGHURT

BY

THUSHANTHINI SHANTHAIYA

FACULTY OF AGRICULTURE

EASTERN UNIVERSITY

SRI LANKA

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ABSTRACT

Somatic cells are important components found naturally in milk. Somatic cell count (SCC) is used as an indicator of milk and dairy product quality. Yoghurt is a fermented dairy product obtained by lactic acid fermentation of milk. This study was conducted to evaluate the influence of SCC on the physicochemical properties, microbial counts, and sensory qualities of yoghurt made from cow milk. Milk was divided into four groups according to the range of SCC (P1: 3.6×10^5 cells/ml; P2: 4.5×10^5 cells/ml; P3: 5.4×10^5 cells/ml; P4: 7.2×10^5 cells/ml). The yoghurts made from different range of SCC milk were analyzed for chemical parameters (pH, titratable acidity, fat, protein, total sugar, reducing sugar, ash content, and dry matter), physical parameter (syneresis), sensory qualities and microbial population on weeks first, second, third and fourth weeks after production.

There were no significant differences ($p>0.05$) in ash, dry matter, titratable acidity, pH, total sugar, reducing sugar and fat contents among the SCC ranges of milk. But, the total protein content of yoghurt was increased with increasing milk SCC. High content of total protein (3.62±0.01%) was observed in 7.2×10^5 cells/ml SCC range of milk. At day one, yoghurt made from milk with 3.6×10^5 cells/ml SCC shown high value of dry matter, fat, reducing sugar, total sugar and pH as (18.7±0.1%), (2.77±0.12%), (2.85±0.09%), (2.85±0.09%), (15.64±0.04%) and (4.49±0.01), respectively. Yoghurt made with 7.2×10^5 cells/ml SCC range shown high ash, total protein and titratable acidity as (1.05±0.03%), (3.91±0.6%) and (0.86±0.02%), respectively.

During the storage period, ash, dry matter, pH, and titratable acidity, total sugar, reducing sugar, fat, and protein ($p<0.05$) were significantly differed with SCC range of yoghurt. Yoghurt made with 3.6×10^5 cells/ml SCC range shown high value of fat, reducing sugar, total sugar and pH (2.7±0.1%), (2.71±0.14%), (12.63±0.03%) and (4.43±0.01), respectively during first week of storage. Yoghurt made with 7.2×10^5 cells/ml SCC range shown high value of total protein and titratable acidity as (3.7±0.1%) and (1.18±0.03%), respectively during fourth week of storage. Syneresis of yoghurt was increased with increasing SCC range. Syneresis was high (44.32±0.08%) in yoghurt made with 7.2×10^5 cells/ml SCC range after two hours of analysis.

There is a significant difference ($p<0.05$) was observed between SCC range and sensory attributes (texture, taste, colour, flavour and overall acceptability) of yoghurt evaluated during four weeks of storage period. All sensory attributes of yoghurt decreased with increasing SCC range during storage period. Bacterial colony count of yoghurt increased with increasing SCC range. The maximum amount of bacteria $1.4 \times 10^6 \pm 0.67 \times 10^6$ CFU was observed on 7.2×10^5 cells/ml SCC range of yoghurt at 2 weeks of storage. The overall results indicate that higher milk SCC (7.2×10^5 cells/ml) has a negative effect on the physical, chemical and organoleptic quality of yoghurt than low SCC milk (3.6×10^5 cells/ml).

TABLE OF CONTENTS