EFFECT OF PHYSICOCHEMICAL AND MICROBIOLOGICAL PROPERTIES OF PROBIOTIC-FERMENTED LOW-FAT YOGURT ENRICHED WITH OAT β-GLUCAN DURING COLD STORAGE

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ABSTRACT

This research study aimed to investigate the quality attributes of probiotic-fermented low-fat yogurt enriched with Oat β-glucan (OβG) during cold storage (5 ^{0}C) for 21 days. Low-fat yogurt formulation was based on substitution of fat in the low fat milk with OβG (0.75%, w/v). Four formulations of yogurt were prepared. The control formulation was (without the addition of OβG) prepared from full cream cow milk and fermented by yogurt starter (YS). The first treatment was prepared from low fat milk without OβG and fermented by YS. The second treatment was prepared from low fat milk with the addition of OβG and fermented by YS (YSOβG). The third treatment was prepared from low fat milk without OβG and fermented by *Bifidobacterium lactis* Bb-12, and *Lactobacillus acidophilus* LA-5 (PYS). The fourth treatment was prepared from low fat milk with the addition of 0.75% OβG and fermented by *Bifidobacterium lactis*, and *L. acidophilus* (PYSOβG).

All samples were evaluated for their chemical composition, microbiological properties, the viability of probiotic microorganisms, sensory quality attributes during the storage period. The results indicated that addition of OβG improved the survival of probiotic bacteria and yogurt starter culture during storage period wherein the OβG-enriched yogurt had high viable count. The highest lactic bacteria count was 8×10^{5} CFU/ml, which guarantees their effect and ability to survive in the digestive tract and spread in the intestine. There were some significant differences ($p\geq0.05$) in the treatments due to the microbiological activities and the chemical composition. Total solids, ash, total titratable acidity, total soluble solids increased during refrigerated storage and moisture, pH and lactose decreased during refrigerated

storage. On the other hand, the addition of OβG improved the formation of flavor compounds in yogurt. The substitution of fat with OβG significantly enhanced sensory attributes of yogurt, wherein OβG-enriched samples recorded high score and acceptability. It could be concluded that substitution of fat with OβG is a sufficient delivery truck of probiotic culture and OβG could be used safely in functional dairy products.

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