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Cheese is the generic name for a group of fermented milk-based products produced globally in a wide range of flavours, textures, and forms. The aim of the present study was to evaluate the use of whole milk and skim milk as a source for the production of Cheddar cheese. Cheddar cheese was prepared using microbial rennet from two sources of milk namely whole milk and skim milk with 3.5% fat, the physico-chemical and biochemical properties were determined throughout two months of ripening. The yield of cheese produced using the whole milk was 6% higher ( $p < 0.05$ ) than the yield obtained with skim milk. Cheeses made from whole milk and skim milk was proximate compositionally alike except for ash, moisture and fat contents. The ash ( $3.86 \pm 0.31\%$ ), moisture ( $46.86 \pm 0.29\%$ ) and fat contents ( $28.48 \pm 0.62\%$ ) of cheese made with whole milk were higher ( $p < 0.05$ ) than the ash ( $3.77 \pm 0.67\%$ ), moisture ( $45.97 \pm 0.30\%$ ) and fat ( $26.03 \pm 0.64\%$ ) of cheese made with skim milk. In both cheeses, the moisture contents declined ( $p < 0.05$ ) with ripening, while the pH increased with ripening time. Protein and fat contents did not change significantly with ripening time. The principal component analysis (PCA) using a zNose® (Electronic Sensor Technology Co., Newbury Park, CA, USA) indicated the presence of nine volatile (aroma) compounds that are common in both cheeses. PCA analysis was performed to discriminate the cheeses in terms of aroma with their ripening time. Textural characteristics such as hardness ( $1.05 \pm 0.08$  kg) and adhesiveness ( $6.03 \pm 0.92$  gs<sup>-1</sup>) for cheese made from whole milk lower ( $p < 0.05$ ) than that cheese made from skim milk (hardness  $-1.15 \pm 0.10$  kg and adhesiveness  $-6.13 \pm 0.92$  gs<sup>-1</sup>). Springiness, gumminess and chewiness were not significantly change in both types of cheese. hardness, gumminess and chewiness increased in both types of cheese during the early stage of ripening and decrease gradually at end of ripening whereas springiness and cohesiveness showed similar changes in both cheeses during the ripened period. In this study the cheese made from skim milk was less satisfied than cheese produce from whole milk.