6. Comparison of physico-chemical properties of spontaneously, back-slopped and controlled fermented pearl millet porridge

Faith Chepngeno[1], Kenneth Mbae[1], Mercy Ndwiga[1], Florence Mwobobia[1], Maria-Jose Oruna Concha[2], Joshua Arimi[1]*.

[1]Department of Agriculture, Meru University of Science and Technology. Kenya.

[2]Department of Food and Nutritional Sciences, University of Reading.

*Corresponding author email: jarimi@must.ac.ke

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Abstract

The pearl millet is the major variety of millet and is ranked as the sixth most important grain globally. It plays an important role in combatting malnutrition in developing countries due to its resistance to drought and superior nutritional characteristics. However, it is underutilised. Pearl millet is mainly processed into porridge either through spontaneous or back slopping which results in inconsistent quality. This study aimed to develop a fermented pearl millet porridge using controlled fermentation and compare its physico-chemical properties with the spontaneous and back slop fermented porridge. The spontaneously fermented pearl millet porridge samples were collected from vendors in Meru Town, Kenya. The pH values ranged from 2.39-3.00; TTA values from 0.92-1.18%, and viscosity between 0.15-0.92 Pa/S. The pH, TTA and viscosity of back slopped fermentation were monitored over a period of 72 hours. The pH values decreased from 6.78 to 3.22, TTA increased from 0.04 to 0.45% and viscosity increased as fermentation time increased from 0.41 to 0.48 Pa/S. Preliminary experiments were also carried out using five commercial cultures in order to identify the best cultures for controlled fermentation. The starter cultures used include Lactobacillus plantarum, Lactobacillus delbrueckii subsp. bulgaricus & mixed cultures containing heterolactic Lactobacillus fermentum and Leuconostoc). The porridge fermented with Lactobacillus plantarum had a pH of 3.98, TTA of 0.10% and viscosity of 1.46 Pa/S. The mixed culture of S. thermophilus, Lb. bulgaricus, L. lactis s3ubsp. Lactis resulted in a pH of 4.04, TTA of 0.10% and a viscosity of 1.21 Pa/S. The eXact® KEFIR 2 culture produced porridge with a pH of 4.18, TTA of 0.03% and a viscosity of 0.88 Pa/S. YoFlex Harmony 1.0 resulted in pH, TTA and viscosity values of 4.95, 0.02% and 0.90 Pa/S, respectively. The XPL-1 starter culture produced porridge with a pH of 4.18, TTA of 0.03% and viscosity of 0.86 Pa/S. Among the tested cultures, Lactobacillus plantarum proved to be the most effective acidifier.

Key words: Pearl millet, fermentation

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