

## Fortification of *Magwinya* with Chicken Eggs for Quality and Nutritional Improvement

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### Abstract

*Magwinya*, is a cereal-based deep-fried snack that is consumed as staple food or breakfast in several Sub-Saharan African countries. The effect of egg addition (10-30% v/w) in *magwinya* formulation as a protein source for quality and nutritional improvement. Completely randomised block design was used to select the samples for analyses in triplicates for both traditional and modified *magwinya*. Chemical properties (moisture, ash, protein, and fat content) and physical properties (texture and colour of crumb and crust) of enriched *magwinya* were determined and compared with the control. Traditional *magwinya* had 9.73% protein, while modified had 9.75% for control sample. The egg-enriched traditional and modified *magwinya* had a significant increase in protein content compared to control sample. There was a significant ( $p < 0.05$ ) decrease in moisture, ash, and fat content in modified *magwinya* enriched with egg (MME) and traditional *magwinya* enriched with egg (TME). The hardness of TME ranged from 1551.72 to 1954.63 g and MME ranged from 1289.38 to 2437.01 g. The colour ( $L^*$ ,  $a^*$ ,  $b^*$ , chroma, hue angle and colour difference ( $\Delta E$ ) of crust showed no significant difference for both TME and MME, while for crumb shows a significant ( $p < 0.05$ ) increase except for hue angle in TME. MME crumb colour showed a significant increase in  $a^*$ ,  $b^*$  and  $\Delta E$ . *Magwinya* enriched with 30% (v/w) egg resulted in higher protein, lower oil content, brownness, and ash contents compared to control and other samples. The appearance, aroma, taste, texture, and overall acceptability of TME and MME were significantly higher than control. Protein enrichment using chicken eggs significantly improved quality and nutrition in both traditional and modified *magwinya*. From the study, egg-enriched *magwinya* improved the overall quality which offers a more nutritious *magwinya* to consumers.