



**A comparative study on the quality of
traditional opaque sorghum wort/beer
developed from proportions of sorghum and
finger millet malts**

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ABSTRACT

Finger millet malt is superior to sorghum malt in terms of saccharifying power, flavour profile and foam-head enhancing properties. In this study, the effect of partial or complete replacement of sorghum with finger millet in malting on the quality of traditional opaque sorghum wort/beer was investigated. Composite malts were prepared by substituting finger millet into sorghum at 0, 20, 30, 40, 50 and 100 % followed by determination of diastatic power (DP), solubility, malt activity, total bacteria count, moisture content and free amino nitrogens (FANs). All malts were dried/kilned to achieve moisture content less than 10 %. Laboratory scale brews were set up using the malts and analysed for physico-chemical and sensory properties by standard methods. Malt analysis showed that sorghum malt had the highest diastatic power (32.78 SDU/g) while finger millet malt had the least diastatic power (8.61 SDU/g). The diastatic power of composite malts decreased with increasing percentage of finger millet from 27.33 SDU/g at 20 % substitution to 19.69 SDU/g at 50 % substitution. Solubility and malt activity of the malts were similarly affected. Sorghum malt had the highest solubility and malt activity of 97.37 % and 31.92 respectively while finger millet had the least (90 % and 7.75 respectively). No trend was observed for the development of FANs in the malts. However, all malts had relatively high FANs with sorghum malt having the highest (228.60 mg FAN/100 g) and finger millet malt having the least (154.76 mg FAN/100g). The results of physico-chemical analysis showed that the highest percentage of total reducing sugars in wort was achieved with sorghum malt (7.28 %) while the lowest was observed with finger millet malt (3.31 %). A decrease in total reducing sugars was observed with increasing percentage of finger millet in the composite malts from 7.1 % at 20 % substitution to 6.61 % at 50 % substitution. Replacing sorghum with finger millet in malts resulted in improved head properties of beer. From 20 % substitution to 50 % substitution there was an increase in head size after 48 hrs of fermentation. However, beer produced from finger millet had the least head size. Substituting finger millet into sorghum did not improve alcohol content and beer brewed from sorghum malt had the highest alcohol content of 3.11 % after 48 hrs of fermentation. Beer brewed from finger millet had the least alcohol content at all stages of fermentation with as low as 1.21 % alcohol content after 48 hrs. Sensory analysis showed that all beers were generally fairly accepted up to 50 % added finger millet. Beer was most accepted at 50 % added finger millet with a mean product acceptability of 75.4 % compared to beer produced from sorghum malt which had a mean product acceptability of 70 %. Statistical analysis (one way ANOVA) showed that the difference in mean product acceptability was significant ($P < 0.05$). In conclusion, the addition of finger millet is recommended in order to improve head-foam properties and the sensory quality of traditional opaque sorghum beer.