Microwaving of sorghum grain: effects on shelf-life of flour as evaluated based on the sensory characteristics of porridge

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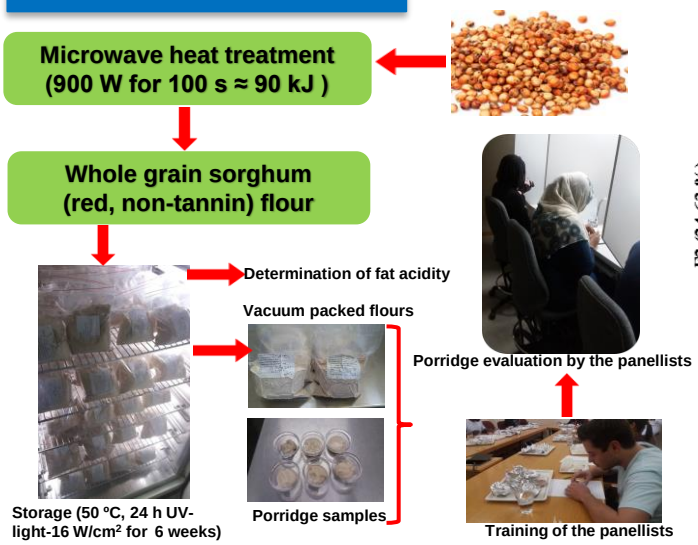
INTRODUCTION

Sorghum is a staple food crop for millions in sub-Saharan Africa. However, the flour goes rancid within a short duration due to lipid oxidation[1] causing unpleasant off-flavour/aroma and limited shelf life[2]. Sorghum flour quality is of concern to all the stakeholders in the value chain[3]. **Therefore, could microwaving of sorghum grain be a solution?**

OBJECTIVE

To determine the effects of microwaving sorghum grain on the shelf life of flour based on the sensory characteristics of porridge, with the aim of improving the stability of flour.

EXPERIMENTAL DESIGN



RESULTS AND DISCUSSION

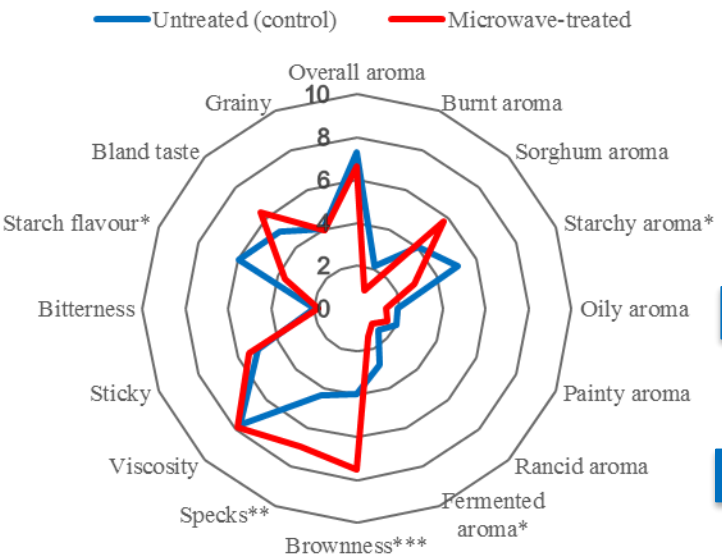


Fig. 1 Descriptive profiles of porridges from control and microwave-treated sorghum grain flours.
*p < 0,05; **p < 0,01; ***p < 0,001 (10 = very intense)

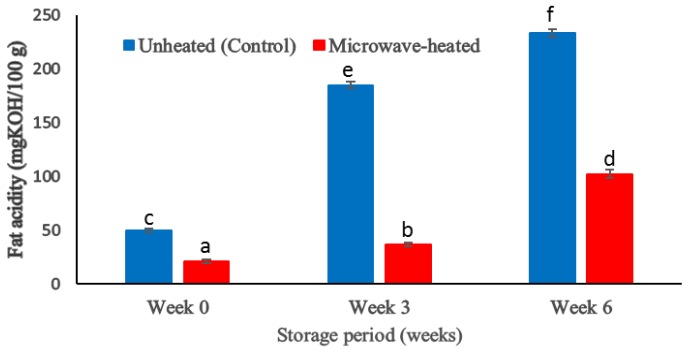


Fig. 2 Microwaving sorghum grain on fat acidity values of flours stored for up to 6 weeks. Bars with different letters differ significantly ($p < 0.05$)

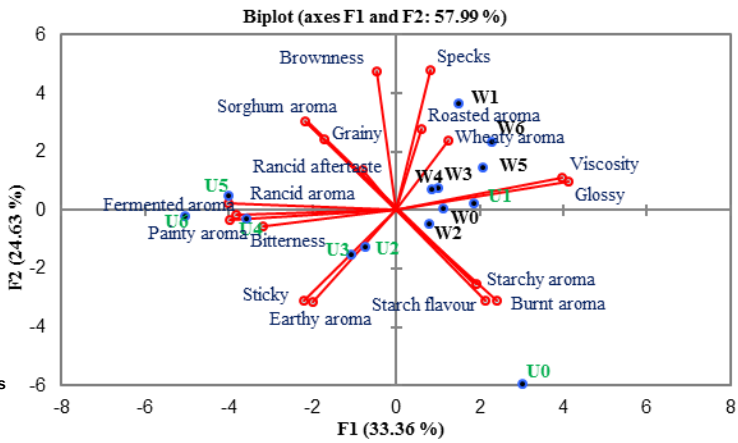


Fig. 3 PCA plot of the sensory attributes of porridge from untreated (U) and microwaved (W) sorghum grain flour stored for 0 to 6 weeks.

- Microwaving of sorghum: made the porridge darker but with less fermented and starchy aroma intensities.
- Reduced fat acidity of flour: may imply inactivation of lipase enzymes.
- F1: Shows relationship between the control at week 0 and microwave-treated samples. With storage periods, the controls deviated from treated samples with attributes like rancid, painty and fermented aroma.
- F2: Microwave-treated samples appear intense brown colour with visible specks. Brownness may be due to the formation of Maillard reaction products

CONCLUSIONS

Microwaving of sorghum grain at 90 kJ/100 g slows the development of rancidity in stored flour and can potentially improve the stability of the flour.

REFERENCES

1. Meera et al. (2011). LWT-Food Sci. Technol., 44, 2199-2204.
2. Kebakile et al. (2007). Cereal Foods World, 52(3), 129-137.
3. Viscidi et al. (2004). LWT-Food Sci. Technol., 37(7), 789–796.

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