



Effects of microwaving sorghum grain on the sensory characteristics of porridges prepared from flours stored for up to 6 weeks at 50°C

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INTRODUCTION

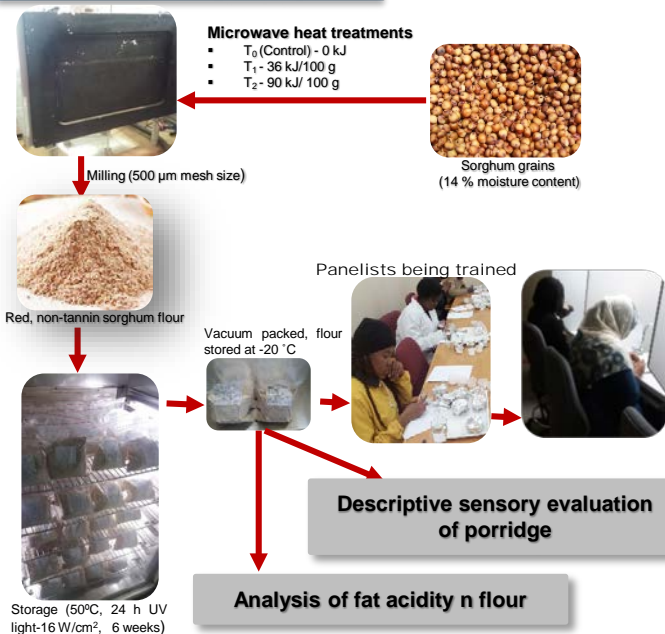
Sorghum, a staple food to millions in sub-Saharan Africa, is processed into many food products, most notably porridges. However, its flour develops rancid off-flavours during storage, due to lipid deterioration¹ resulting in limited shelf-life and poor product sensory quality². This is of concern to all stakeholders in the sorghum value chain³.

Could microwave pre-treatment of sorghum grain improve the flour stability?

OBJECTIVES

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 flour and product quality

EXPERIMENTAL



RESULTS & DISCUSSION

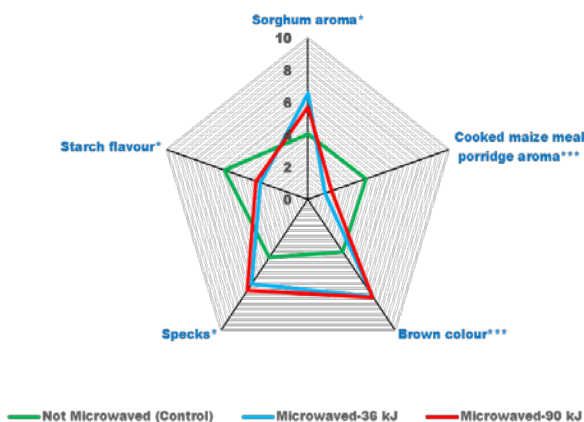


Fig. 1 Descriptive profile of porridges from not microwave-treated (control), microwave-treated with 36 kJ and 90 kJ sorghum grain flours at baseline (week 0). *p < 0,05, **p < 0,01, ***p < 0,001 (10 = very intense)

Biplot (axes PC1 and PC2: 76.8 %)

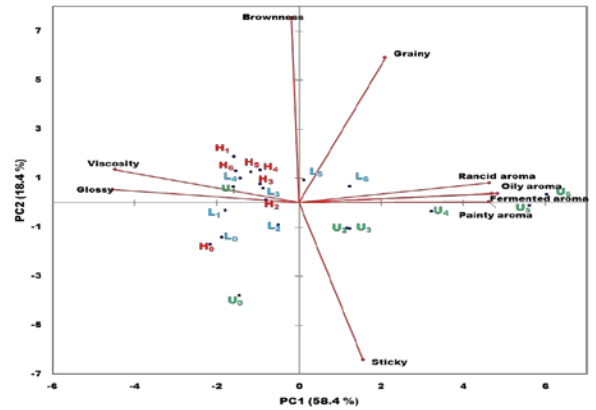


Fig. 2 PCA plot of the sensory attributes of porridge from control (U), microwave treated-36 kJ (L) and 90 kJ (H) stored for 0 to 6 weeks

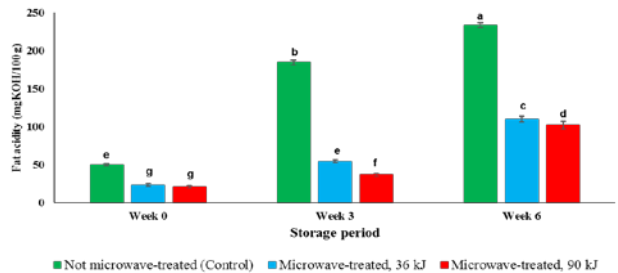


Fig. 3 Effects of microwaving sorghum grain on the fat acidity of flour stored for 0, 3 and 6 week. Bars with different letters differ significantly.

❖ Microwaving of sorghum made the porridge darker brown, with more specks, less intense cooked maize porridge but more intense sorghum aroma (Fig. 1).

❖ *Probably due to formation of Maillard reaction products*

❖ **PC1:** With storage, more intense rancid, oily, fermented and painty aromas were noted for the control than those of microwave-treated samples (Fig. 2).

❖ *possibly due to formation of volatile secondary products of unsaturated fatty acid oxidation.*

❖ **PC2:** explains colour and texture differences (Fig. 2).

❖ Higher fat acidity for control than the microwave-treated flours (Fig.3).

❖ *free fatty acids in control due to lipase hydrolysis of triglycerides after milling of grain to flour.*

❖ *The lower fat acidity of microwave-treated flour due to inactivated lipase in the grain.*

❖ *96 kJ/100 g more effective than 36 kJ/100 g .*

CONCLUSIONS

Microwave pre-treatment of sorghum grain retards the development of rancidity and improves flour stability, more at 90 kJ/100 g than 36 kJ/100 g. The pre-treatment changes the sensory properties of the porridge. Further studies on consumer acceptability of porridge and economic viability of the treatment is essential.

REFERENCES

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