Micronised Green Banana Flour as a Raw Material for Food Applications

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Abstract

Obesity and diabetes are becoming major public health problems in South Africa and across the globe. The prevalence of diabetes in South Africans has kept increasing during the last two decades, making South Africa one of the countries with the highest global projected increase in diabetes risk for the next 25 years. Epidemiological studies show that frequent consumption of high glycemic index (GI) foods is associated with high risk of obesity and type 2 diabetes. As one of the solutions, the consumption of green banana flour (GBF) has been suggested because it is associated with reduction of the GI, lower risks of type 2 diabetes and obesity. This study investigated the effect of micronisation (a high intensity infrared heating method) on the functional properties, molecular structure and antioxidant activity of GBF cultivars grown in South Africa. The swelling power, resistant starch (RS) (Megazyme kit) and antioxidant activity (DPPH and FRAP assays) of Grande Naine and FHIA-01 cultivars were determined. The GBF was micronised at three surface temperatures (90, 120 and 150 °C for 30 min). Micronisation at the highest temperature (150 °C) increased the swelling power by approx. 6% on both GBF cultivars when compared control (un-micronised GBF). With RS, micronisation reduced the RS of both cultivars (Grande Naine and FHIA-01) by 4% and 6%, respectively. Both micronized and control GBF exhibited similar XRD patterns with both cultivars at all micronisation temperatures. This suggest that micronisation did not affect the crystallographic structure of the GBF cultivars. The antioxidant activity of both GBF cultivars increased after micronisation with the highest increase (approx. 9%) observed with Grande Naine (FRAP assay). In general, the results of this study demonstrate the potential application of the micronisation technique in improving the quality of GBF for use as a raw material for the production of gluten-free products. However, further analysis on other GBF cultivars and method optimization are required to reduce the negative effect on RS.

Biography: Minenhle Khoza

Minenhle Khoza is a lecturer and Work Integrated Learning (WIL) coordinator at the University of Johannesburg (UJ), Department of Biotechnology and Food Technology. She's currently pursuing her PhD in Food Technology at the University of Johannesburg, where she is a member of the Golden Key International Honour Society (GKSA) and the South African Association for Food Science and Technology (SAAFoST). Her research areas of interest are: Food Waste Valorisation, Phytochemicals and Antioxidants in food, Food Product Development, African Indigenous Fruit and Vegetables as Superfoods. Her current research is on banana flour as a functional food and its uses as a raw material for food applications. She is very passionate about academic development and youth empowerment. As a WIL coordinator, her role

is to provide pastoral care and support to students, while ensuring that students have a smooth transition from tertiary to the world of work.