

## CHAPTER 7

### CONCLUSIONS AND RECOMMENDATIONS

All the stiff porridges prepared from unrefined and refined flours of the three cereals used in this study (maize, sorghum and pearl millet), except that from refined flour of sorghum NK 283, were less digestible than that of the white wheat bread.

Cereal species (maize, sorghum and pearl millet) does not affect the rates of *in vitro* starch digestibility of the stiff porridges.

Probably due to the higher proportion of amylopectin in the starch, porridge from refined flour of sorghum NK 283 was more digestible than the porridges from other varieties. However, the stiff porridge made from the unrefined flour did not show this effect probably due to relatively high levels of non-tannin polyphenols in the flour.

Non-tannin polyphenols appear to lower starch digestibility of the stiff porridges prepared from flours containing high levels of polyphenols.

Refinement of cereal grain flours does not improve the rates of *in vitro* starch digestibility of the stiff porridges prepared from low non-tannin polyphenol grains but it does so for the stiff porridges prepared from relatively high non-tannin polyphenol grains.

Based on the findings of this study, diabetic people can use maize, sorghum or pearl millet in unrefined or refined forms without discrimination as none of them differ significantly in-terms of GI. None of the three cereals can be claimed as more suitable than the others in diabetes management. However, if there are varieties known to have a high amylopectin/amylose ratio in their starches, like sorghum variety NK 283, they should be avoided as a diet for diabetic people, because this type of starch is associated with higher rate of starch digestibility and hence higher GI which is unsuitable for diabetics. On the other hand, varieties known to contain relatively high levels of non-

tannin polyphenols may be useful for diabetics in the unrefined form, as these grains have shown both lower starch digestibilities and GIs.

The major difference between this study and that of Zhang and Hamaker (1998) was that in this study no significant differences in the rates of *in vitro* starch digestibility were found, neither between the stiff porridges prepared from the intermediate grains of maize and sorghum, nor, between maize and pearl millet. This appears to be contrary to the findings of who found that cooked sorghum flours had lower starch digestibility (15 – 25%) than normal maize flour, regardless of whether the endosperm type was floury, dense floury or vitreous. Regarding the differences, more studies are required on how different porridge preparations methods (procedure, water addition, starch concentration, cooking, cooling rate, storage time) impacts on the formation of more enzyme-resistant starches. Also studies on how various preparation steps might interact with grain components (or types) with different hardness levels are required before considering possible relationships between varying levels of hardness of different grains and the GI.