

CHAPTER 3

RESEARCH OBJECTIVES

Objective 1

To determine whether stiff porridges made from flours of different cereals; maize, sorghum and pearl millet have different rates of *in vitro* starch digestibility.

Objective 2

To determine whether stiff porridges made from flours of different varieties of the same species have different rates of *in vitro* starch digestibility.

Objective 3

To determine the rates of *in vitro* starch digestibility of stiff porridges prepared from unrefined and refined flours of maize, sorghum and pearl millet, and find out whether refinement improves digestibility.

Hypothesis 1

Digestibility of the starch from stiff porridges prepared from sorghum flours would be lower than those from maize and pearl millet, due to the presence of rigid protein body and matrix cover in sorghum, which probably restrict the starch granules from fully gelatinising and hence resulting to lower starch digestibility.

Hypothesis 2

Digestibility of the starch from stiff porridges prepared from unrefined pearl millet flours would be lower compared to the other cereals, due to its high fat content from the large germ in the grain. The large amount of fat might block some parts of the starch surface area and limit accessibility of the starch to enzyme action; also, the formation of amylose-lipid complex superstructures is known to lower starch susceptibility to α -amylase.

Hypothesis 3

The rate and extent of starch digestibility of stiff porridges prepared from unrefined flours would be lower than those from refined flours. The presence of bran (pericarp, testa and aleurone layer), fat and antinutritional substances which are present in higher amounts in unrefined than in the refined flours may directly or indirectly interfere with the enzymic digestion. This could be through restriction or inhibition of the enzyme activity, or possibly by blocking or binding of the starch granules.