

## CHAPTER 3

### RESEARCH OBJECTIVES

#### Objective 1

To determine the *in vitro* starch digestibility of traditional stiff maize porridge compared to that of white bread in order to establish whether maize porridge is a slow, intermediate or fast carbohydrate release food.

#### Objective 2

To determine the effect of cooking conditions (time and hotplate vs. microwave) on the digestibility of starch in maize porridge. The two groups of researchers who obtained conflicting results (Walker & Walker, 1984; Venter *et al.*, 1990) used different cooking conditions to prepare the maize porridge.

#### Objective 3

If the starch digestibility of maize porridge differs from that of bread, attempt to establish whether the difference is due to intrinsic or extrinsic factors.

#### Objective 4

To determine the effect of endosperm vitreousness on the *in vitro* digestibility of maize porridge. The hypothesis was that maize porridge made from cultivars with a hard endosperm would have a lower rate and extent of digestion than porridge from cultivars with a softer endosperm. Because the starch granules of hard endosperm are tightly packed in the protein matrix, expansion would be limited and it would be difficult to gelatinise the starch. In the soft endosperm, where the starch granules are more loosely packed and there are many air spaces, gelatinisation would take place more easily. Native starch is less susceptible to enzyme digestion than gelatinised starch (Holm *et al.*, 1985).

## Objective 5

To determine the effect of particle size on the *in vitro* digestibility of maize porridge. The hypothesis was that digestibility would increase with a decrease in particle size, because a decrease in particle size would increase the surface area of the particles which would be in contact with the enzymes (Colonna *et al.*, 1992).