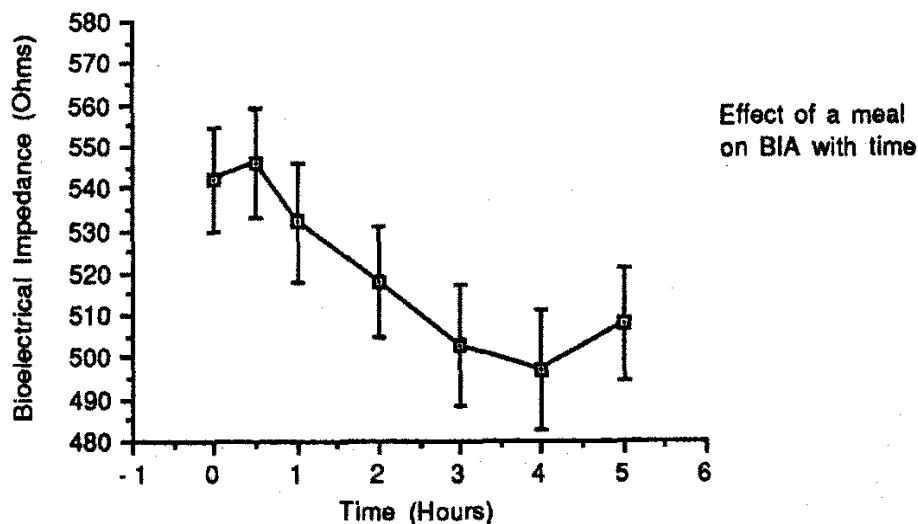


THE EFFECT OF A BREAKFAST MEAL ON BIOELECTRICAL IMPEDANCE

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Interest in the use of bioelectrical impedance (BIA) as a method of assessing nutritional status is increasing due to its potential as a simple, rapid, reproducible and non-invasive technique but there is some concern regarding variables that may affect the measurement of BIA. Deurenberg et al. (1988), for example, have shown that exhaustive exercise, ingestion of food and menstruation all cause significant alterations in BIA readings. The manufacturer's instructions recommend that BIA measurements are made 3-4 hours post-prandially. However Deurenberg et al. (1988) have shown significant decreases in BIA over the five hours following a liquid meal. This is of importance if measurements are made in the non-fasting state. The meal used by Deurenberg was a liquid meal with 30% energy from fat; 15% from protein and 55% from carbohydrate. It is possible that eating a semi-solid meal, such as breakfast, may provide a more realistic assessment of the significance of the effect of a meal on BIA. The aim of this study was therefore to determine the effect of a standard breakfast on BIA over a 5 hour period.

Twenty-nine male and female staff from the Department of Human Nutrition (aged 20-42 years) participated in this study with informed consent. After a 12 hour overnight fast an impedance measurement was made. Height and weight were determined to the nearest 0.1cm and 100g respectively. Breakfast was then consumed immediately (28% energy as fat; 11% as protein and 61% as carbohydrate). Subjects consumed the meal within 20 minutes. At thirty minutes, 1, 2, 3, 4, 5 hours after the fasting measurement further readings were taken. Changes in BIA were tested for significance with paired Student's t-test and results are expressed as mean \pm standard error of the mean. The results show (Fig.) that following a slight rise immediately after the meal readings decreased so that at 2, 3, 4 and 5 hours after the meal impedance is significantly lower than fasting impedance ($P < 0.01$).



To ensure consistency in the interpretation of BIA as a method of body composition analysis, it is important that impedance is measured in the fasting state or within one hour after a meal.

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Eur. J. Clin. Nutr. 42: 1017.