Proceedings of the Nutrition Society (2015), **74 (OCE1)**, E5 doi:10.1017/S0029665115000208

Summer Meeting, 14–17 July 2014, Carbohydrates in health: friends or foes

Glycaemic index and perceived satiety following ingestion of sourdough breads enriched with soluble fibres

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High-glycaemic index (high-GI) diets have been linked to the prevalence of type II diabetes[1–3], coronary heart mortality, certain types of cancer and elevated blood levels of triglycerides and LDL cholesterol[3]. Previously, sourdough was successfully used in development of low GI wheat bread[4] and was demonstrated to produce improved glycaemic response even in subjects with impaired glucose tolerance[5]. Additionally, viscous soluble fibre may reduce postprandial glycaemia[6]. Despite the fact that soluble fibres were shown to produce prolonged satiety[7,8], the findings of studies concerning the satietogenic properties of carbohydrate remain inconclusive[9]. The aim of this study was to assess the glycaemic and satietogenic properties of sourdough bread enriched with soluble fibres, control sourdough bread, and white wheat bread.

The glycaemic and satietogenic properties of sourdough bread enriched with soluble fibres (XG/GA/Pec), control sourdough bread and white wheat bread (WWB) were tested in a cross-over study using 11 healthy participants (mean age 35 ± 10 years, BMI 23·7 ± 2·86 kg/m^2), a standard seven-point protocol and Satiety Labelled Intensity Magnitude (SLIM) scale.

	Glycaemic index		iAUC of satiety response	
	Mean	SE	Mean	SE
Control sourdough	65·70^{d}	9·56	6407·96^{c,d}	591·41
XG/GA/Pec	58·93^{d}	8·85	6799·77^{c,d}	752·24
WWB	69·83^{d}	7·79	4459·81^{a,b}	487·34
Glucose	100^{a,b,c}	2·34E-15	2401·31^{a,b}	655·92

The differences of values with different superscripts in columns are statistically significant ($p < 0·05$).

GI values were 66 for control sourdough bread ($p = 0·03$), 59 for XG/GA/Pec ($p = 0·006$) and 70 for white sliced bread ($p = 0·019$) with glucose as reference food (GI = 100). After 120 minutes from ingestion, subjects reported higher satiety after control sourdough bread ($p = 0·027$) and sourdough with XG/GA/Pec ($p = 0·001$) than after glucose. Additionally, the bread with XG/GA/Pec was perceived by the subjects to be more satiating after 120 minutes than WWB ($p = 0·036$). iAUC for control sourdough bread and XG/GA/Pec was higher than those of glucose ($p = 0·018$ and $p = 0·007$ respectively) and WWB ($p = 0·045$ and $p = 0·036$ respectively). The value of iAUC of XG/GA/Pec was higher than that of control sourdough bread. This result did not reach statistical significance in statistical analysis. In conclusion, sourdough bread and sourdough bread enriched with soluble fibres were characterised by increased perceived satiety. Delayed gastric emptying is a plausible explanation of the satietogenic properties of sourdough breads enriched with soluble dietary fibre.

This study was conducted according to The Declaration of Helsinki.

Acknowledgements: Dr Joanna Kershaw, Dr Emma Derbyshire, Dr Weili Li and Prof. Charles Brennan. The author would like to acknowledge the help of Prof. Glyn Phillips.

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