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## Predicting glycaemic index in cereal and legume-based foods from macronutrient composition data

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Available carbohydrates have a crucial role in human subjects' diet, providing the majority of energy metabolites. In 1980, the glycaemic index (GI) concept was developed as a tool to compare foods in their ability to provide glucose to the blood circulation after ingestion and absorption in individuals. Studies have shown a relationship between GI and non-communicable metabolic diseases such as type 2 diabetes<sup>(1)</sup>. However, measuring the glycaemic response *in vivo* is time-consuming, expensive and requires the participation of human volunteers<sup>(2)</sup>. The aim of the study was to investigate the relationship between GI and macronutrient composition using statistical methods, and to test the hypothesis that GI can be predicted from composition data without the need for human volunteers. The relationship between GI and macronutrient composition was investigated in twenty foods from the cereal and legume groups using multiple regression analysis methods. The results indicated that starch and protein were the only macronutrient that correlated significantly with GI values (Pearson = 0.523  $P < 0.05$ , and Pearson's  $r = -0.513$ ,  $P < 0.05$ , respectively). A model was established correlating GI to protein and starch content (expressed in g/50 g available carbohydrate portion) as  $GI = 54.201 - 2.304 (\text{protein}) + 0.731 (\text{starch})$ . The equation closely predicted GI values of cereal based foods, but was not suitable for legume-based foods (see table below). Future work will concentrate of confirming the predictions using *in vivo* GI measures.

Predicted GI values calculated regression equation compared with published GI values<sup>(3)</sup>.

	Food	Predicted GI	Published GI	Difference	Percentage error (%)
<b>Cereal-based dishes</b>					
1	Weetabix	77	75	-2	-2
2	White bread	74	75	1	2
3	Whole meal flour	69	73	4	5
4	Vegetable pilau	61	63	2	2
5	Cake rusks	55	70	15	22
6	Fruit cake	56	70	14	20
<b>Legume-based dishes</b>					
7	Channa (chickpeas)	48	23	-25	-107
8	Mixed dhal (mixed lentils)	49	39	-10	-25
9	Mung dhal (mung bean)	48	34	-14	-42
10	Tarka dhal (yellow split peas)	49	21	-28	-133
11	Urad dhal (black lentils)	48	43	-5	-13

1. WHO/FAO (2003) World Health Organization Technical Report Series. 2003/05/29, Geneva.
2. Jenkins AL (2007) *Cereal Foods World*, **52**, 50–53.
3. Aston LM, Jackson D, Monsheimer S *et al.* (2010) *Obes Rev* **11**, 92–100.