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Characterising dietary glycemic load in a representative sample of Irish adults

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Glycemic Index (GI) is a method of ranking the quality of carbohydrate (CHO) containing foods according to their response to post-prandial glycemia, whereas glycemic load (GL) assesses the total glycemic effect of the diet ranking both the quality and quantity of CHO foods[1]. The underlying principle is that a low GI/GL diet is digested and absorbed more slowly than a high GI/GL diet hence regulating postprandial insulin and blood glucose levels[1]. Potential health benefits of following a low GI diet include a reduced risk of obesity, diabetes mellitus and cardiovascular disease[1]. To date, there is little published data regarding the overall GI and GL of Irish adults' diets.

The aim of this research is to describe the dietary GL of a representative sample of 1500 Irish adults and to analyse their GL in relation to nutrients consumed. Data from the National Adult Nutrition Survey (NANS)[2], which recorded food and beverage consumption using a semi-weighed 4-day food diary, was used for this analysis. The final sample consisted of 1051 adults aged 18–90 y after exclusion of under-reporters[3]. NANS includes 2552 individual food codes; for the current analysis the GI of food items was assigned using previously published data[4–6]. Dietary GL was calculated as the product of the food's GI and its CHO content (g) divided by 100[7]. Mean daily intakes of energy and nutrients were examined across quartiles of GL.

	Quartiles of GL							
	1		2		3		4	
	30–116		*116–143*		*144–177*		*178–378*	
	21:79		30:70		62:38		86:14	
GL Range M:F (%)	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age (years)	48.79^{ab}	17.93	45.81^{abc}	16.52	43.08^{bcd}	17.03	39.40^{cd}	16.24
BMI (kg/m^2)	25.77	4.82	26.04	4.17	26.35	4.19	26.54	4.16
Energy (MJ)	6.86^{a}	1.57	8.48^{b}	1.51	9.87^{c}	1.39	12.29^{d}	2.16
Protein (% TE)	17.87^{a}	3.99	16.61^{bc}	3.20	15.88^{bcd}	2.93	15.40^{cd}	2.84
Fat (% TE)	36.50^{ab}	6.69	35.54^{abc}	5.40	34.32^{bcd}	6.12	33.94^{cd}	5.65
Carbohydrate (% TE)	42.16^{a}	7.34	44.88^{bc}	6.79	46.32^{bc}	6.35	49.00^{d}	6.94
Total Sugars (% TE)	16.16^{ab}	6.34	17.46^{abc}	6.17	18.64^{bcd}	5.38	20.51^{d}	5.92
NMES (% TE)	6.33	4.04	7.60	4.34	8.89	4.18	10.92	5.70
Starch (% TE)	25.18^{a}	5.78	26.57^{bcd}	5.01	26.79^{bcd}	5.12	27.65^{bcd}	5.67
Dietary Fibre (% TE)	3.88	1.44	3.93	1.29	3.72	1.26	3.68	1.22
Calcium (mg/10MJ)	1215.97^{ab}	571.73	1126.71^{abcd}	457.41	1110.42^{bcd}	381.31	1050.49^{bcd}	279.85

M = Male, F = Female, BMI = Body Mass Index, %TE = Percentage contribution to total energy intake. NMES = Non Milk Extrinsic Sugars.
^{abcd}Different superscript letters indicate significance between quartiles (One-Way Analysis). Values not showing common significance ($P<0.05$).

Those in the highest quartiles were younger, predominantly male, had a higher BMI and consumed a significantly greater amount of energy than those in the lower quartiles. Amongst the nutrients examined, %TE from protein and fat was significantly lower in the highest than the lower quartiles. Conversely, %TE from CHO, total sugars, NMES and starch were significantly higher in those consuming high GL diets. Amongst micronutrients calcium was significantly lower in the highest quartiles than the lowest quartile.

To conclude, those who consumed a higher GL diet had a higher energy, starch and sugar intake, while having a lower protein, fat, fibre and calcium intake. The inverse relationship found between intakes of fats and sugars reiterates previous research into this sugar-fat paradigm[8]. Further research will consider differences in food intakes and any relationship between dietary GL and biomarkers of health between the groups.

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