# THERMIC AND GLYCAEMIC RESPONSES TO PASTA AND BREAD MEALS

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The glycaemic response (GR) to pasta is lower than the GR to the same amount of carbohydrate eaten as bread (Truswell 1992). The aim of this study was to simultaneously measure thermic and glycaemic responses to pasta and bread based meals to investigate whether the thermic effect of food (TEF) is also lower after pasta than bread.

The study was conducted on 14 healthy volunteers (7M, 7F, age 34.6 ± 13.8 years, Body Mass Index 24.4 ± 3.9 kg/m$^2$). Each volunteer was studied on five occasions, the first a 'training' day (results discarded), and two pairs of measurements, one with a bread based meal and one with a pasta based meal. For each meal pair, subjects walked briskly for 45 minutes two hours before lunch on one day, and took no exercise on the other day (n=28 bread versus pasta comparisons, 14 with exercise and 14 without). Both meals provided 58 g carbohydrate and 2400 kJ. Energy expenditure (EE) was measured from 11.30 to 12.00 h (pre-meal) and 12.30 to 15.30 h (post-meal) using a ventilated hood. Blood glucose (BG) was measured using the finger prick method and an Acutrend meter at 12.00 h (pre-meal), 12.30 h (15 minutes post-meal) and every 30 minutes until 15.30 h. Subjects standardised their diet and activity patterns for 24 h prior to each study day, and consumed the same meal at 07.30 h on each study morning. TEF was calculated by subtracting the pre-meal EE from the post-meal average. Glycaemic responses (GR) were calculated during the first two hours after the meal from the area under the BG curves using the pre-meal BG as the baseline (incremental method, INCR) and the lowest BG as the baseline (absolute method, ABSOL).

The results (mean ± SD, n=28) are shown in the Table. Paired students t-tests showed lower TEF, peak BG levels, GR and post-meal rise in respiratory quotient (RQ) after the pasta meal ($P<0.05$). Bread versus pasta differences were similar for exercise and no exercise treatments except for no difference in incremental GR without exercise.

| | Pre-meal EE (kJ/24h) | TEF (kJ/3h) | Pre-meal RQ | Post-meal RQ | Rise in RQ | BG (mmol/l) | | GR (mmol/2h) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Pre-meal | Peak | INCR | ABSOL |
| Bread | 6827 | 154 | 0.809 | 0.868 | 0.059 | 4.42 | 6.86 | 175 | 216 |
| | ±1210 | ±69 | ±0.05 | ±0.03 | ±0.05 | ±0.56 | ±0.89 | ±78 | ±77 |
| P | NS | 0.04 | NS | NS | 0.008 | NS | 0.001 | 0.02 | 0.01 |
| Pasta | 6827 | 124 | 0.826 | 0.862 | 0.036 | 4.49 | 6.40 | 139 | 174 |
| | ±1332 | ±50 | ±0.04 | ±0.03 | ±0.04 | ±0.72 | ±0.80 | ±73 | ±68 |

This study confirms previous reports of lower glycaemic responses to pasta meals compared with bread, and show that the thermic effect of food is also lower after pasta than bread, at least during the first three hours after the meal.

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