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ORIGINAL RESEARCH

A low-glycemic index diet does not alter postprandial energy metabolism but reduces postprandial insulinemia and increases fullness scores in healthy women - Evidence review

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1. ABSTRACT

The analyzed study compared two diets with equal energy, macronutrient, fiber, and energy density intake, but different glycemic indices, after ten weeks of ad libitum feeding. In the 29 healthy overweight women, the low-glycemic index meal produced lower postprandial glucose and insulin concentrations, slightly greater subjective fullness, and a reduced desire for fatty foods. However, it did not alter energy expenditure, energy substrate oxidation, or energy intake at lunch.In paragraph 2.1.1 of “The Choice to Live in Health or Illness” by Dr. A. Colonnese and R. Panzironi, the publication specifically contributes to the hypothesis that a low-glycemic index diet may promote appetite control through a lower glycemic and insulin response after a meal. Independent studies show partially convergent results, but other controlled experiments do not detect differences in hunger or satiety. Confirmation is therefore moderate for the subjective satiety signal and does not demonstrate a consistent effect on actual food intake.

ONLINE ARTICLE

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MISSION

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Through articles, reviews, in-depth analyses and expert contributions, the Journal champions evidence-based medicine and science, fostering a correct interpretation of scientific data and countering misinformation. Every piece of content is developed with the aim of translating the complexity of research into understandable, useful and applicable information, while keeping intact the principles of accuracy, transparency and scientific independence.

Free from political, industrial and commercial influence, the journal stands as an authoritative and independent editorial space, dedicated to promoting scientific culture, professional development and the growth of health awareness among the public.

2. ANALYZED STUDY

The research question was whether a diet consumed for ten weeks with a low glycemic index could modify the body's response after a meal compared to a high glycemic index diet. The glycemic index describes how quickly a carbohydrate-containing food tends to increase glycemia. The authors evaluated not only blood glucose and insulin but also feelings of hunger, satiety, and fullness, energy expenditure, and ad libitum food intake at the following lunch.The relevance to section 2.1.1 of "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi mainly concerns the subjective result: after the low glycemic index meal, participants reported greater fullness and less desire to eat fatty foods. The study therefore documents a possible link between carbohydrate quality, lower postprandial insulin response, and appetite perception. However, it cannot demonstrate that this difference produces lower energy intake, weight loss, or disease prevention in the long term.

3. MATERIALS AND METHODS OF THE ORIGINAL STUDY

Only the abstract is available; information not included in it is not available for this Evidence Review. The study included 29 healthy overweight women, with a mean age of 30.5 ± 6.6 years and a mean body mass index of 27.6 ± 1.5 kg/m². For ten weeks, two groups followed a diet providing 55% of energy from carbohydrates on a free-living, non-inpatient basis: one with a low glycemic index of 79, and one with a high glycemic index of 103.At the end of the intervention, participants underwent a four-hour test following a breakfast corresponding to their assigned diet. The two breakfasts differed in glycemic index but were identical in total energy, macronutrient composition, fiber, and energy density. Glucose, insulin, and various gut or metabolic hormones were measured; energy expenditure, relative use of carbohydrates and fats as fuel, subjective feelings of appetite, and the amount eaten ad libitum at lunch were also recorded. The abstract does not report the method of group assignment, complete inclusion and exclusion criteria, dietary adherence, detailed statistical analyses, the magnitude of differences, or data on gastric emptying.

4. RESULTS

In simple terms, a low-glycemic index breakfast resulted in lower blood exposure to glucose and insulin compared to a high-glycemic index breakfast. Plasma glucose and serum insulin were lower in the low-glycemic index group; the abstract indicates a $P \leq 0.05$ value for these comparisons, which is a statistically significant difference according to the threshold adopted by the authors. The absolute values, areas under the curve, or the percentage magnitude of the reductions are not reported in the abstract.Regarding the passage cited in the book, the central data point is subjective but consistent in the observed direction: fullness ratings were slightly higher after the low-glycemic index meal and the desire to eat something fatty was lower, with $P < 0.05$. The abstract does not report significant differences in general hunger, overall satiety, ad libitum energy intake at lunch, energy expenditure, or substrate oxidation rates. In other words, the participants felt a bit fuller, but they did not eat less at the measured lunch.Among other biological signals, the low-glycemic index meal reduced glucagon-like peptide-1, or GLP-1 (an intestinal hormone that participates in the regulation of insulin secretion and appetite), and increased glucose-dependent insulinotropic peptide, or GIP. No differences emerged for GLP-2, glucagon, leptin, ghrelin, energy expenditure, and substrate oxidation. These results do not allow for attributing the increase in fullness to a single hormone.

5. INTERPRETATION

The most immediate implication is that, in this sample, choosing low-glycemic index foods for ten weeks resulted in a lower glucose and insulin response to the subsequent breakfast, without changing how much energy the body consumed over the following four hours. The publication subject to this Evidence Review therefore supports the following sequence: low glycemic index lower postprandial glycemia and insulinemia slight increase in perceived fullness and reduced desire for fatty foods.The data on fullness is consistent with a potential benefit for appetite control, but it remains a subjective indicator collected in a single four-hour test. Since the ad libitum lunch did not differ between the groups, it cannot be concluded

that the increased fullness actually reduced calorie intake. Furthermore, the reduction in glucose and insulin does not in itself prove to be the cause of the difference in sensations: digestion, sensory characteristics of the meals, dietary habits, and individual differences may all contribute to the response.The wording of paragraph 2.1.1 of "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi is therefore supported at the level of a possible subjective modulation of appetite. It is not supported, by this isolated study, as proof of a stable reduction in hunger, daily caloric intake, or body weight.

6. INDEPENDENT SUPPORTING EVIDENCE

Direct confirmation, although not perfectly overlapping, comes from a controlled crossover study conducted on 80 adults of normal weight or with overweight/obesity. After 28 days of a low glycemic load diet, participants reported 7% greater satiety and fewer food cravings compared to the high glycemic load diet; in women, the difference in satiety was more evident. Glycemic load combines the quality and quantity of carbohydrates, so it does not coincide with the glycemic index alone. Furthermore, the diets also differed in fiber content: the study supports the narrative direction of the book, but does not completely isolate the effect of the glycemic index [1].A second, much larger observational study makes the link between blood glucose trends and appetite biologically plausible. In 1,070 healthy adults from a British exploratory cohort and a US validation cohort, drops in glycemia two to three hours after standardized meals were associated with greater hunger, less time until the next meal, and higher subsequent energy intake. For example, the glycemic drop was associated with higher energy intake over 24 hours with $r = 0.27$ and $P < 0.001$. This does not prove that a low glycemic index diet prevents such drops or that it causes satiety, but it confirms that certain postprandial glycemic dynamics can be relevant to appetite [2].Taken together, these independent results support a cautious chain of reasoning: smaller glycemic fluctuations after meals may be accompanied by a reduced urge to eat in some contexts. Confirmation remains incomplete because subjective measures of appetite do not always coincide with the food actually consumed and because glycemic index, glycemic load, fiber, and meal composition are often difficult to separate.

7. CONFLICTING EVIDENCE

Evidence regarding appetite control is not uniform. In a crossover study of 16 healthy adults with overweight or obesity, four breakfasts differed in glycemic index and protein content. Low-glycemic index breakfasts reduced glucose and insulin responses but did not alter hunger, satiety, predicted food intake, or the amount actually consumed four hours later. This study contradicts the idea that a lower insulin response necessarily leads to greater satiety [3].Another crossover study, conducted in 26 adults with overweight or obesity and controlled for energy and fiber, compared four dietary patterns with different glycemic indices and carbohydrate levels over an entire day. Reducing the glycemic index or carbohydrates decreased the area under the curve for glucose and insulin compared to a high-glycemic index, high-carbohydrate diet, but did not produce significant differences in hunger, fullness, or satiety scores. This result is particularly relevant because it confirms the metabolic component of the narrative, but not the subjective component of appetite [4].Differences between studies may depend on the duration of the intervention, sex, meal composition, fiber, total carbohydrate amount, palatability, and the method used to measure appetite. No directly conflicting evidence sufficiently relevant to a lower specific desire for fatty foods has been identified; this does not prove the absence of contrary results.

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

The table distinguishes the results of the publication under review from independent verifications relevant to the specific narrative on appetite.

Quadro comparativo

Reference	Study type	Population or model	Main result	Direction of evidence	Strength of evidence
Original study	10-week dietary intervention with meal test	29 healthy overweight women	Low glycemic index: lower postprandial glycemia and insulin; slightly greater fullness; lower craving for fatty foods; no difference in energy intake at lunch.	direct confirmation	moderate
[1]	Crossover RCT with controlled feeding	80 normal-weight or overweight/obese adults	Low glycemic load diet associated with 7% higher reported satiety and lower food cravings.	direct confirmation	moderate
[2]	Prospective observational study with validation cohort	1,070 healthy adults, standardized meals and ad libitum meals	Post-meal glycemic dips associated with greater hunger and higher subsequent energy intake.	biologically consistent evidence	moderate
[3]	Crossover RCT	16 healthy overweight or obese adults	Low glycemic index: lower glucose and insulin responses, with no differences in hunger, satiety, or energy intake.	discordant evidence	moderate
[4]	Full-day crossover RCT	26 overweight or obese adults	Reduction in glucose and insulin with low glycemic index or lower carbohydrates, with no differences in hunger, fullness, or satiety.	discordant evidence	moderate

9. SINTESI EDITORIALE E CONCLUSIONI

CONCLUSIONS

The analyzed study shows that, in healthy overweight women, ten weeks of a low-glycemic index diet are associated with a lower postprandial glucose and insulin response and a slight increase in reported fullness after breakfast. The reduced desire for fatty foods is consistent with a potential benefit for appetite control, but this did not translate into lower consumption at the subsequent lunch. Independent evidence partially confirms this narrative, while other studies do not detect effects on hunger and satiety. The link is moderately supported and requires validation in larger, longer studies with objective measures of food intake.

Aggiornato al 17/11/2026. Questo contenuto riflette una sintesi divulgativa delle evidenze scientifiche al momento della pubblicazione e non sostituisce il parere medico.

10. TRANSPARENCY AND SCIENTIFIC RESPONSIBILITY

Artificial Intelligence was used solely as a tool for editorial and documentary support. All content, interpretations, bibliographic citations and conclusions have been verified, reviewed and approved by the author, who assumes full scientific responsibility for them.

The manuscript was also subjected to independent peer review prior to publication.

To ensure the greatest transparency, the complete history of the article, including the dates of submission, revision, acceptance and publication, as well as information on the peer review process, is available on the dedicated Article History page.

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