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Letter to the Editor

Glycaemic load and cognition: comments concerning Marchand *et al.*

We read with interest the study by Marchand *et al.*[1] who compared high and low glycaemic load (GL) trifles and found no significant effects on cognitive performance in young adults. As they suggest, this is a topic where there are inconsistencies due to differences in methodology. We would like to suggest three factors that may have contributed to their negative findings.

The first is the GL of the two meals. Although total carbohydrate (50 g) is reported, it is unclear how much of this came from the experimental sugars and how much came from other ingredients in the trifle. An important observation is that a relatively small difference in GL occurred (44 *v.* 33). The pattern of changes in blood glucose was considerably less than in many studies[2–7]. Studies that have compared isomaltulose and glucose, rather than sucrose, produce a bigger difference in blood glucose[2,3]. An obvious suggestion is that the small difference in GL played a part in the present negative findings. Additionally, there is large interpersonal variability in postprandial glucose response to the same food[8], although this was not considered by Marchand *et al.*[1]. Studies that have considered individual glycaemic responses have often found this factor to be important[3].

Although great trouble was taken to ensure that the two breakfast items were identical in all respects other than the type of sugar, this approach ignores the interaction with other nutrients. It is possible that the nature of the foods consumed played a role in the non-significant findings. A trifle, for those unfamiliar with this English dessert, contains fruit, cake, custard, cream and often alcohol. We can only guess as to the actual ingredients but given the overall fat content you can guess that it contained dairy products, possibly milk in custard and cream. In this area, using milk is a problem, given its insulinogenic properties and the likelihood that insulin, and the consequent fall in blood glucose, is a potential mechanism[9,10]. The insulinotropic nature of dairy products may disguise any benefits associated with a lower rather than a higher GL. Although they report that their meals were similar in all respects, they also say that some were served vegan alternatives. This must have influenced the composition of the meal as dairy products would not be served.

It is particularly surprising that the study only monitored changes for 2 h, as a frequent finding has been that changes do not occur in the first 2 h but after at least 3 h and more commonly 4 h. One study in young adults found no influence on memory after 30 or 90 min although a low GL was associated with better memory after 150 and 210 min[11]. Similarly, in children a meal sweetened with isomaltulose resulted in better mood and memory after 3 but not 1 h[2].

We agree with the authors' assessment that methodological issues may explain the inconsistent findings regarding glycaemia and cognitive functioning. There remains a need for studies that establish those aspects of the diet that are critical. Although negative findings have been reported, there are sufficient positive findings in the existing literature to suggest that there is an underlying beneficial mechanism. There remains the need to go beyond studies that consider GL in isolation and place it in a wider context. We hope that the suggestions presented here may lead the way to profitable future research in this area.

The authors declare they have no conflicts of interest.

Hayley Young and David Benton

Psychology Department, Swansea University, Wales, UK

email d.benton@swansea.ac.uk

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