

Letters

Diabetes and Diet

In her article "Dietary dogma disproved" (Research News, 29 Apr., p. 487) Gina Kolata reports on recent work highlighting the wide range of blood glucose responses to foods containing different complex and simple carbohydrates. These results indicate that equivalent amounts of different carbohydrate foods are not necessarily equivalent metabolically. For example, a portion of carbohydrate that is slowly digested and absorbed (such as legumes) is not equivalent to one that is rapidly digested and absorbed (such as potatoes or pure glucose). As reported, Jenkins and co-workers have compiled an extensive list of commonly eaten foods in terms of their "glycemic index": the flatter the postprandial blood glucose response to a particular food relative to pure glucose, the lower the glycemic index (1). They have suggested that this information can be used as a physiological basis for the design of diets for diabetics, incorporating foods with low glycemic indexes and excluding those with high glycemic indexes. Thus, carbohydrate of leguminous origin having the lowest glycemic indexes would be the most appropriate for inclusion in such diets. However, by the criterion of glycemic index alone, ice cream is as good as a variety of legumes, and potato chips are considerably better than fresh potatoes. These were in fact the very examples given in the article as illustrating the "incorrectness of the dietary dogma."

It is an oversimplification, however, to imply that all foods with low glycemic indexes are appropriate for inclusion in the diet of diabetics. This does not take into account either the short- or the long-term effects of other nutrients (such as fat and sugar) and suggests an approach to the dietary treatment of diabetes that concentrates on ameliorating the symptoms (hyperglycemia) immediately, rather than attempting to correct the underlying metabolic defect (insulin resistance) in the long term.

Because fat delays gastric emptying when carbohydrate is eaten in combination with fat (as with ice cream or potato chips), the rate of absorption of the carbohydrate is slower than when carbohydrate is eaten alone. Superficially this

may seem like an advantage. However, closer analysis reveals that the situation is much more complicated in both the short and the long term. In a recent study in normal subjects comparing the metabolic responses to potatoes with or without butter, we observed that, despite the flattening of the blood glucose response which was evident when carbohydrate was ingested with fat, there was no parallel reduction in the insulin response (2). This suggests that the plasma insulin response to a given glucose concentration was actually potentiated in the presence of fat. This would clearly not be beneficial to the diabetic and highlights one of the potential problems in studying blood glucose responses (glycemic indexes) in isolation from the plasma insulin responses.

The problems do not end there. Taylor and his co-workers compared blood glucose responses to high fat or high carbohydrate breakfasts followed by a standard lunch (3). They observed a worsening of glucose tolerance to the standard lunch that had been preceded by a high fat breakfast, despite the lower blood glucose response to the high fat breakfast. They concluded that fat consumption may impair the glycemic response to the subsequent meal and that foods with a low glycemic index and a high fat content may not improve overall diabetic blood glucose control.

On a longer time scale, high fat, low carbohydrate diets have been shown to impair glucose tolerance and insulin sensitivity (4), consistent with the epidemiological observations linking diabetes prevalence in a population positively with fat and total energy intake and negatively with unrefined complex carbohydrate intake (5).

Finally, it is generally agreed that weight control is a critical factor in the successful treatment of noninsulin-dependent (type 2) diabetes. Certain foods with low glycemic indexes (such as ice cream and potato chips) are energy-dense foods containing nutrients such as fat and fructose which do not contribute directly to the blood glucose response but which must be taken into account when one assesses the overall impact of such foods on diabetic control.

Thus, while I agree in principle with the concept of using the glycemic index

of carbohydrate-containing foods as a guide for the design of diabetic diets, it can be highly misleading when used as the sole criterion.

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References

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Funding University Research

Columbia and Catholic universities have demonstrated (News and Comment, 3 June, p. 1024; 10 June, p. 1132; 24 June, p. 1358) an innovative, but potentially quite damaging, technique for obtaining increased funding. The recipe would seem to be as follows: Dust off your most wanted research plans, engage an experienced and battle-tested Washington lobbying firm, circumvent the usual peer review and authorization processes, apply pressure at critical points in the appropriation process, and, sure enough, millions of dollars may be within reach. The dollars do come, of course, from programs at other institutions which have been reviewed and scrutinized and judged to be worthy of public support.

One cannot really criticize Congress for behaving as it sometimes feels it must, nor hired guns for doing what they were hired to do, but university administrators should know better than to engage in such irresponsible practices. If all universities were to adopt the Columbia-Catholic technique, then no research program in any university would be immune from sudden and arbitrary cancellation. Research support would then be a matter of which university could mount the most effective lobbying effort. That is a bleak scenario, one which offers little long-term benefit to the research universities or, indeed, the nation.

Faculty at Columbia and Catholic universities might wish to advise their respective administrations to abjure the use of these invidious tactics.

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