Next will be apple pie$^{1,2}$

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Three articles appear in this issue of the Journal (1–3) that challenge a long-held belief of both nutrition scientists and the lay public: breakfast is the most important meal of the day. Of course this is true, if you are selling breakfast cereals. Putting profits aside, the consumption of breakfast is currently part of course this is true, if you are selling breakfast cereals. Putting profits aside, the consumption of breakfast is currently part of 1 most weight-reduction procedures and 2) school breakfast pro- programs designed to improve cognitive/school performance. The publication of these articles may give us reason to examine the veracity of these ideas.

Consider the relation between eating breakfast and body weight. There is a huge literature supporting the fact that large people don’t eat breakfast, and it is augmented by the observation that successful dieters have a greater tendency to eat breakfast than does the general population. There are only 3 logical mech- anisms that can explain this observation: 1) skipping breakfast increases food intake at subsequent meals, causing overeating and obesity; 2) eating breakfast increases metabolic rate, allow- ing breakfast eaters to stay slim; and 3) large people and suc- cessful dieters eat breakfast.

Does skipping a meal, such as breakfast, increase food con-sumed at subsequent meals sufficient to compensate for the lost meal? The evidence, contrary to our intuition, is a very convinc- ing “no” (4, 5). In fact, caloric compensation occurs only when the test food is consumed ~1.5 or 2 h after consuming the initial meal, a phenomenon known as “preloading,” which may have more to do with gastric extension than energy regulation.

The studies by Betts et al (1) and Dhurandhar et al (2) further test the first 2 hypothesized mechanisms responsible for the relation between eating breakfast and body weight. The study by Betts et al (1) was a randomized controlled clinical study of the effects of eating breakfast (700 kcal) on a host of metabolic measurements (resting metabolic rate, body composition, anthropologic measurements, blood lipids, glucose, and relevant hormonal measurements) as well as energy intake. Although food intake was measured by using food diaries, the results are consistent with the data derived from direct measurements of food intake: skipping breakfast does not result in a substantial increase in subsequent food intake but rather decreases total daily energy consumed. In terms of energy, this study also showed that eating breakfast does increase metabolic rate (ex-cept for the thermic effect of eating breakfast) but not suffi- ciently to counter the influx of calories consumed at breakfast. The only indication of any energetic compensation for eating breakfast was a small increase in light voluntary exercise, a phenomenon that is probably more related to the beliefs about breakfast rather than a reflection of energetic compensation.

Dhurandhar et al (2) also tested the first 2 hypotheses in a lon-ger-term study by examining the energetic consequence of eating breakfast on weight change over a 16-wk period. If eating the first meal early in the day (breakfast) affects energy balance differently than beginning to eat later in the day (no breakfast), then observ- ing weight change over a long period of time would be a good test of the hypotheses. They randomly assigned participants into 3 groups. They were 1) given instructions as to how to eat more healthfully (control condition), 2) given instructions to eat break-fast before 1000 h, or 3) given instructions not to eat before 1000 h (the no-breakfast group). Contrary to both hypotheses, skipping breakfast neither increased intake at subsequent meals nor lowered metabolic rate as indicated by identical weight changes across the 16 wk of observation.

Both studies, therefore, argue against the first 2 hypotheses and support the third hypothesis, and most plausible explanation: large people don’t eat breakfast and successful dieters believe they should eat breakfast.

Edefonti et al (3) addresses another long-held belief among nutritional scientists and the public: eating breakfast improves cognitive performance. This issue is as much political as it is scientific, because school breakfast feeding programs have been supported, in part, by the argument that serving breakfast im- proves school performance. So it is with hesitation that one prods the evidence linking the consumption of breakfast to cognitive function ing or to school performance. In many ways probing this problem is similar to the issue of whether early malnutrition causes brain damage, for fear that finding that it doesn’t cause brain damage will imperil international feeding programs (6, 7).

Yet, the truth must be told, and Edefonti et al (3) performed a thorough review of the literature on the effects of breakfast on cognitive/academic performance, mostly in children. As with many reviews, almost every individual study examined tests different aspects of cognition, controls for different variables, does not control for others, feeds different foods at breakfasts that differ in composition and calories, uses subjects of different ages, and so forth, all of which add considerable heterogeneity to the review, making it very difficult to make a very strong
conclusion. As a result, no consistent relation emerged between the consumption of breakfast and cognitive/academic performance. With the lack of solid evidence affirming the beneficial effect of eating breakfast on cognitive/academic performance and the fear of the high prevalence of childhood obesity, it seems unwise to argue that school breakfast programs should be used to boost school performance. Rather, it may be wiser to argue that providing school breakfast is effective in increasing school attendance, and school attendance is a good predictor of academic achievement (8).

Myths abound in nutrition. Many, like the consumption of breakfast, are driven by powerful commercial interests. In the current environment in which the major nutritional problem we face is the increasing prevalence of obesity, we, as nutrition scientists, must consider the possible harm we are doing by perpetuating myths such as the value of consuming breakfast. Surely, eating breakfast adds to the quality of nutrients consumed, but breakfast foods can be eaten at lunch or dinner as well. As nutrition scientists, we have the responsibility of testing the veracity of such practices and must have the courage to speak out against such practices when necessary, even when it looks like we are taking away motherhood and apple pie. Actually, reducing the portion size of apple pie might not be a bad idea, either.

REFERENCES