



## Paleo diet still lacks evidence

Dear Editor:

We had been looking forward to the publication of the systematic review by Manheimer et al. (1), which examined the effect of the “paleolithic diet” on components of metabolic syndrome. The “paleo diet” has been circulating in popular culture, but we wanted to see sound nutrition evidence before recommending dietary changes. However, we were very disappointed when we finally read the article. The abstract, specifically, overstates their findings—so much so that going by their statements you would have the impression that the paleo diet was significantly better than the control diet for people with metabolic syndrome. This article is another example of nutrition research conclusions that misrepresent the actual findings (2). We suggest that the Journal needs a higher standard for the interpretation of statistics and policies regarding accurate representation of research findings when *P* values are not shown. This overstatement by the researchers is particularly concerning given the current popular media’s habit of oversimplifying and overstating study results.

The authors stated in their abstract that “paleolithic nutrition resulted in greater short-term improvements than did the control diets” for 6 outcomes. Under closer inspection, 4 of these 6 results had CIs that were not significant, and all 6 of them were not compatible with any important clinical effects. Specifically, for waist circumference, the wide CI had a lower boundary of only 0.04 cm, a possible average outcome of the paleolithic diet. Furthermore, the estimated average differences for most of the primary outcomes were small (diastolic blood pressure:  $-2.5$  mm Hg; HDL cholesterol:  $0.12$  mmol/L; fasting blood sugar:  $-0.16$  mmol/L; systolic blood pressure:  $-3.6$  mm Hg) and not likely of clinical or practical importance. All of the variables had wide CIs, which points out that no important change at all is a possible outcome of the paleolithic diet. Furthermore, the analyses on waist circumference, triglycerides, and HDL cholesterol all had high heterogeneity, which decreases confidence in the estimates.

Another concern is that Manheimer et al. (1) analyzed the included studies not as comparisons between the groups as recommended (3) but as changes from baseline. Baseline diets were not randomly assigned, and changes from baseline can be due to other things that change with time (3).

Some aspects of the promoted paleo diet as defined in the included studies in Manheimer et al. (1) are desirable, including increased vegetables and the elimination of low-nutrient processed foods. However, the philosophy-based paleo diet has not been adequately assessed for whether the restriction of dairy foods (good sources of protein, calcium, and phosphorus), legumes (excellent sources of protein, fiber, and nutrients), and grains (inexpensive staple foods for most populations) are actually health-promoting, as they claim.

In real practice, many people, including popular proponents of the paleo diet such as online bloggers and cookbook writers, are merely adapting their Western diet to align with paleo diet restrictions; for

example, desserts made with “paleo”-acceptable alternatives such as almond flour and honey instead of sugar and wheat flour (<http://ditchthewheat.com/best-paleo-chocolate-brownies-ever/>). In this case, the paleo diet philosophy is extremely unlikely to change health outcomes for anybody but those with celiac disease.

We are also concerned about some of the comparisons in the article by Manheimer et al. (1). The randomized controlled trials included in the meta-analysis compared the paleo diet with older diets, specifically low-fat diets that were recommended 10–15 y ago. It is now established from evidence from randomized controlled trials that replacing saturated fats with highly processed carbohydrate foods (e.g., sugars and high-glycemic starches) does not decrease cardiovascular disease risks (4), so we should not use a low-fat diet as the comparator in future studies of the paleo diet.

We agree with the researchers that bone health has not been adequately studied among people consuming a paleolithic diet (1). They mentioned that urine calcium was lower with the paleo diet in 1 study and cited 2 older narrative reviews that suggest that “alkaline aspects” of the diet may allay any concerns about bone health deterioration. Higher-quality evidence showed that urine calcium is not a useful measure of bone health because it does not consider calcium absorption and retention, the latter being the superior assessment of calcium status (5). In summary, we do not believe that the results of their study provide evidence in support of the paleo diet and urge researchers and health practitioners to remain diligent in making evidence-based recommendations for health promotion.

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