The implication of unknown bioactive compounds and cooking techniques in relations between the variety in fruit and vegetable intake and inflammation

Dear Sir:

We read with great interest the article by Bhupathiraju and Tucker (1), which appeared in a recent issue of the Journal. The authors performed a cross-sectional study in which fruit and vegetable variety but not quantity was inversely associated with C-reactive protein (CRP) concentration as an inflammatory marker. In fact, the potential relations of fruit and vegetable intake with inflammation status have been thoroughly investigated, including in nutrigenomics studies (2–4), and could be considered as an important approach for health maintenance and disease treatment in terms of prescribing "antiinflammatory" diets.

Indeed, the outcome of this study is worth reading, but some specific points should be considered. First, a greater variety of fruit and vegetables putatively involves a wider diversity concerning the intake of other bioactive compounds, which are not or are less recognized (5). The authors could have performed a stepwise multiple regression analysis to determine the fruit and vegetables that are consumed more often as well as those fruit and vegetables included in the highest tertile of variety of these food groups, and so to identify the role of less commonly consumed fruit and vegetables, but with a relevant potential antiinflammatory effect.

Another point of discussion is the cooking techniques used to prepare the vegetables (eg, boiling or lightly frying), which might influence the bioavailability of bioactive compounds (6, 7). In this sense, high-heat treatment of foods has been found to modulate biomarkers related to cardiovascular diseases (8). Thus, it would have been very useful to know whether the vegetables consumed were cooked in the preparation process.

Finally, the inclusion of dietary fat intake (g/d) or *trans* fatty acid (g/d) in the linear and logistic regression models, as an adjustment covariate, also should have been considered by the authors to assess the potential association between fruit and vegetable variety and CRP concentrations, because dietary fat as well as some types of fatty acids have been implicated in changing plasma inflammatory marker concentrations (9, 10).

Readers might have appreciated this study even more if the authors had provided more information concerning these issues.

None of the authors had any conflicts of interest to declare.

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Reply to HH Hermsdorff et al

Dear Sir:

We thank Hermsdorff et al for their interest and comments on our recent article (1). They raise important questions, and we are grateful for the opportunity to clarify these points. We agree that substantial evidence shows that greater intakes of fruit and vegetables are associated with lower inflammation. However, as explained in our article, the lack of significant associations between fruit and