

Plant-Based Diet Quality is Associated with Changes in Plasma Adiposity Biomarker Concentrations in Women

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Introduction

Baden et al. (1), in their recent publication, analyzed data from 831 women who participated in the Nurses' Health Study II and were followed for 13 y. They concluded that adherence to a healthful plant-based diet is favorably associated with lower concentrations of biomarkers for adiposity and inflammation. It is well established that excess visceral fat, which increases with age and body weight, promotes metabolic dysregulation in those biomarkers associated with inflammation and insulin resistance (2) and that these conditions are exacerbated during menopause (3). The participants in this study had an increase in BMI (in kg/m²) from 24.6 to 26.3 and menopausal status increased from 20.6% to 72.1% over 13 y, making this an ideal population to study the effects of plant diets and biomarkers of inflammation as adiposity and other risk factors increase.

Plant-based diets have been associated with lower risk of chronic diseases including cardiovascular disease, type 2 diabetes, and cancer (4). However, it is also clear that the quality of plant-based foods can vary extensively depending on their composition. For example, those plant-based foods that are rich in antioxidants, vitamins, minerals, and fiber would have a much better quality than those high in simple sugars and *trans* fatty acids. Based on this recognized variability, plant diet indexes have been classified according to quality into 3 groups: overall plant-based diet index (PDI), which encompasses all categories of plant foods including both healthy and nonhealthy diets; healthful plant-based diet index (hPDI); and unhealthy plant-based diet index (uPDI) (5). The hPDI diets comprise those foods rich in whole grains, fruits, vegetables, and nuts, whereas the uPDI foods represent higher consumption of fruit juices, sugar-sweetened beverages, refined grains, and sweets.

The use of cross-sectional analyses with multivariate adjustment clearly demonstrated in Baden et al.'s study (1) the occurrence of favorable changes in those biomarkers associated with adiposity. For example, those participants who had the highest intake of hPDI foods showed a number of beneficial effects including lower concentrations of leptin, insulin, and high-sensitivity C-reactive protein (hsCRP) as well as higher concentrations of adiponectin. Because leptin is known for its

role in increasing the production of inflammatory mediators including IL-6 and TNF- α and because adiponectin has been shown to increase insulin sensitivity, these are relevant findings, especially in the case of older and postmenopausal women.

In contrast, those participants with increased intake of uPDI foods had higher concentrations of plasma leptin and insulin. In addition, longitudinal analysis, which evaluated the improved adherence to a healthful plant-based diet over 13 y, concluded that increases in hPDI foods were inversely associated with leptin and hsCRP whereas uPDI foods were positively associated with leptin, IL-6, and hsCRP. These findings are quite fascinating because they show consistency between 2 different types of analysis: cross-sectional and longitudinal. In cross-sectional studies, it is not possible to infer the time course and the directionality of the outcomes, whereas in longitudinal analysis the time of the exposure precedes the outcomes.

These findings also confirm what has been shown in other studies regarding the anti-inflammatory effects of anthocyanins (6), dietary fiber (7) carotenoids (8), and other bioactive components present in healthful plant-based diets. In contrast, the presence of simple sugars (9) and *trans* fatty acids (10) in uPDI foods explains the positive correlations between high intake of uPDI foods and inflammation and the increases in leptin and insulin resistance as assessed by the higher concentrations of these plasma hormones in women.

In summary, the results of the current study demonstrate beneficial effects of healthful plant-based diets on markers of inflammation in women (1). Further, other reports have shown that these diets decrease cardiovascular disease (5) and the incidence of diabetes (11). These findings (1, 5, 11) also emphasize that it is not the quantity but the quality of plant-based diets that is a key determinant for the prevention of chronic disease.

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Abbreviations used: hPDI, healthful plant-based diet index; hsCRP, high-sensitivity C-reactive protein; uPDI, unhealthy plant-based diet index.

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