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<https://doi.org/10.1016/j.jaip.2018.05.002>

## Possible contribution of decreased phytoprostanes to diet-induced improvements in aspirin exacerbated respiratory disease



To the Editor:

The pilot study showing the potential of dietary changes to affect aspirin-exacerbated respiratory disease (AERD) is an important step toward understanding and exploiting the role of diet in the treatment of asthma and rhinitis.<sup>1</sup> As the authors point out, the greatly increased consumption of vegetable oils has caused an increase in omega-6 fatty acids including arachidonic acid, the precursor of prostaglandins and leukotrienes. However, we should not assume that all of the improvement in this study resulted solely from the decrease in the ratio of omega-6 to omega-3 fatty acids. It is also plausible that benefits accrued from a decreased intake of plant phytoprostanes present in plant oils.

Although the enzymatic modification of omega-6 arachidonic acid to prostaglandins (via cyclo-oxygenase) and to leukotrienes (via lipoxygenase) is doubtless important, it should be noted that there is also a non-enzyme-mediated pathway of arachidonic acid metabolism in humans, wherein arachidonic acid is converted by free-radical oxygenation to a third class of inflammatory mediators, the isoprostanes.<sup>2</sup> Isoprostane F<sub>2</sub> is present in exhaled breath condensates of patients with asthma in proportion to the asthma's severity and increases in the urine of asthmatics after allergen challenge.<sup>3</sup> Plants produce proinflammatory analogs of isoprostanes, the phytoprostanes, which are also the products of nonenzymatic oxidation, but in this case of the plants' 18-carbon omega-3 alpha-linoleic acid.<sup>2</sup>

High levels of alpha-linoleic acid are present in vegetable oils, and its auto-oxidation leads to the formation of phytoprostanes in those oils.<sup>4</sup> Studies have found high levels of proinflammatory F1 and E1 phytoprostanes in all oils examined, including olive oil, with levels of phytoprostanes in opened bottles of vegetable oils at room temperature spontaneously increasing 10- to 20-fold over 18 days, despite a lack of noticeable rancidity. When humans ingest these oils, including olive oil or flaxseed oil, their level of serum phytoprostane F1 increases.<sup>4,5</sup>

The current typical Western diet has changed in many ways from that present during human evolution.<sup>6</sup> In the last 70 years alone, the intake of refined vegetable oils has increased from less than a pound to over 50 lbs per person per year in the United States,<sup>6</sup> thus increasing not only the ratio of n-6 to n-3 fatty acids but also the amount of ingested phytoprostanes. Whole plants differ from separated plant oils in that the whole plant contains

antioxidants that minimize oxidative damage, including the formation of phytoprostanes. There are strong reasons to believe that a *whole-food*, plant-based diet is the diet most compatible with human health.<sup>7</sup>

The authors have made an important contribution and have avoided the common error of simply adding a "supplement" rather than changing the diet as a whole. Nevertheless, future studies may want to consider removing flaxseed and olive oils from the "recommended" and "limit" categories, and placing them with the other separated vegetable oils in the "discouraged" column.

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No funding was received for this work.

Conflicts of interest: J. D. Miller is the owner and President of Mission: Allergy, Inc. Received for publication May 18, 2018; accepted for publication May 22, 2018.

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<https://doi.org/10.1016/j.jaip.2018.05.033>

## Indoor environmental interventions for furry pet allergens: How to decrease the degree of passive transport



To the Editor:

We read with interest the excellent article of Ahluwalia and Matsui<sup>1</sup> focusing on interventions for indoor environmental allergens. In the section of "furry pet allergens," the authors have considered predominantly the case of pets at home only hinting at the problem of passive transfer of pet allergens indoors. Although the authors have indicated that pet allergens are carried and passively transferred to environments where no pets may be present, they have not provided any indication on the possible modalities of prevention. Conversely, we believe that this is a central and difficult-to-manage aspect in the context of pet allergy with or without animals at home.<sup>2,3</sup> In fact, deposit of pet allergens in indoor environments without animals correlate with the number of visitors owning or in regular contact with pets. Therefore, the higher the pet ownership in a given community, the higher the presence of pet allergens in apparently pet-free spaces. We<sup>4</sup> and others have shown that clothing