

Correspondence

Reply

To the Editor:

We thank Dr Das¹ for his insightful comments. Although we focused our revision on antioxidant intake, we agree that other nutrients may have protective effects in asthma and allergic diseases. Fatty acids do not have antioxidant properties; nevertheless, they have an active role in anti- and proinflammatory activities. Omega-3 polyunsaturated fatty acids (ω -3 PUFAs) refer to a group of 3 fats known as α -linolenic acid, eicosapentaenoic acid (EPA), and docosahexaenoic acid. Metabolic competition between EPA and arachidonic acid results in decreased production of prostaglandins, and thromboxane. EPA and docosahexaenoic acid give rise to families of mediators that have anti-inflammatory actions. In addition to these effects, ω -3 PUFAs affect cell signaling processes and gene expression in inflammatory cells, resulting in decreased expression of inflammatory cytokines.² Omega-6 polyunsaturated fatty acids (ω -6 PUFAs) are a family of acids that have in common a final carbon-carbon double bond in the n-6 position.³ The most abundant source of ω -6 PUFAs is linoleic acid, which is converted to arachidonic acid, a progenitor of both prostaglandin E₂ and leukotriene B₄ via cyclooxygenase and 5-lipoxygenase enzymatic pathways, respectively. Both prostaglandin E₂ and leukotriene B₄ have proinflammatory biologic actions.⁴ Competitive interactions between ω -3 PUFAs and ω -6 PUFAs determine the cellular content of arachidonic acid (ω -6) and EPA (ω -3). ω -3s are found in high quantity in fish oil and monounsaturated oils such as canola and flaxseed oils, whereas ω -6s are found in polyunsaturated fats such as soybean, corn, safflower, and sunflower oils.

Results of epidemiologic studies have not been conclusive. Almqvist et al⁵ found that plasma levels of fatty acids ω -3 or ω -6 were not associated with asthma-related phenotypes in children with a family history of asthma at age 5 years. Simopoulos⁶ reported that a ω -3/ ω -6 ratio of 5:1 exerts beneficial effects on asthma, while a ratio of 10:1 has adverse effects. In a double-blind randomized controlled trial, D'Vaz et al⁷ found that after receiving a daily supplementation of fish oil from birth

to age 6 months, children improved their levels of ω -3 but there was no difference in the prevalence of allergic outcomes between placebo and supplement groups.

Still, there is much to be known about the effect that diet has on asthma and allergy and on complex diseases in general. The consumption of a healthy diet provides various nutrients that interact among themselves. Identification of the effect of specific nutrients under particular situations appears to be an enormous task. More observational and randomized trials with repeated measurements over time are needed. Complex interactions among diet, environmental exposures, and genetic susceptibility seem to play a crucial role in diseases. Diet may be more easily under people's control than are other factors; thus, the intake of a healthy diet enriched with fruits and vegetables may be a healthy choice.

Hortensia Moreno-Macias, ScD^a
Isabelle Romieu, MD, MPH, ScD^b

From ^aUniversidad Autonoma Metropolitana, Mexico City, Mexico; and ^bthe International Agency for Research on Cancer, Lyon, France. E-mail: hmm@xanum.uam.mx. Disclosure of potential conflict of interest: The authors declare that they have no relevant conflicts of interest.

REFERENCES

1. Das S. Antioxidants and nutrients on allergy and asthma. *J Allergy Clin Immunol* 2014;134: XXX-XXX.
2. Calder P. Long-chain polyunsaturated fatty acids and inflammation. *Scand J Food Nutr* 2006;50:54-61.
3. Chow CK. Fatty acids in foods and their health implications. New York: Routledge Publishing; 2001.
4. Romieu I, Trenga C. Diet and obstructive lung disease. *Epidemiol Rev* 2001;23: 268-87.
5. Almqvist C, Garden F, Xuan W, Mahrshahi S, Leeder SR, Oddy W, et al. Omega-3 and omega-6 fatty acid exposure from early life does not affect atopy and asthma at age 5 years. *J Allergy Clin Immunol* 2007;119:1438-44.
6. Simopoulos AP. Omega-6/omega-3 essential fatty acids: biological effects. *World Rev Nutr Diet* 2009;99:1-16.
7. D'Vaz N, Meldrum J, Dunstan JA, Martino D, McCarthy S, Metcalfe J, et al. Postnatal fish oil supplementation in high-risk infants to prevent allergy: randomized controlled trial. *Pediatrics* 2012;130:674-82.

<http://dx.doi.org/10.1016/j.jaci.2014.06.012>