

## Abstract

# Are There Differences in Cytokine Profiles between Vegetarians and Omnivores? <sup>†</sup>

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**Abstract:** Background: According to scientific evidence, plant-based diets like vegetarian diets may be protective against chronic inflammatory disease. To date, the association of vegetarian nutrition with circulation CRP levels has been noticed and confirmed using meta-analyses. However, further studies are needed to clarify the possible associations between other inflammation markers and vegetarian diets since such data are lacking. Objective: in this study, we investigated the serum levels of a panel of cytokines in vegetarians compared to omnivores by performing flow cytometry quantification of 13 cytokines using a commercially available LEGENDplex bead-based immunoassay kit. Methods: This study included apparently healthy subjects: 80 omnivores and 80 subjects who had been on a vegetarian diet for at least 2 years (67 vegans and 13 lacto-ovo vegetarians). Omnivores and vegetarians were matched for gender, age, and body mass index (BMI). Results: Statistically significant lower circulating levels of IFN- $\gamma$  ( $p < 0.01$ ), TNF- $\alpha$  ( $p < 0.05$ ), IL-6 ( $p < 0.05$ ), IL-8 ( $p < 0.05$ ), IL12p70 ( $p < 0.05$ ), and IL-17A ( $p < 0.01$ ) were found in vegetarians compared to omnivores. We also observed a trend for similar differences in IL-10 levels ( $p = 0.085$ ). The levels of IL-1 $\beta$ , IFN- $\alpha$ 2, MCP-1, IL-18, IL-23, and IL-33 did not statistically differ between the studied groups. Discussion: This study shows the link between plant-based diet and reduced levels of pro-inflammatory cytokines. In conclusion, the levels of some pro-inflammatory cytokines might be influenced by a plant-based diet, suggesting that this type of diet leads to the modulation of the cytokine network and inflammation responses.

**Keywords:** cytokines; immunity; inflammation; vegetarian; diet



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