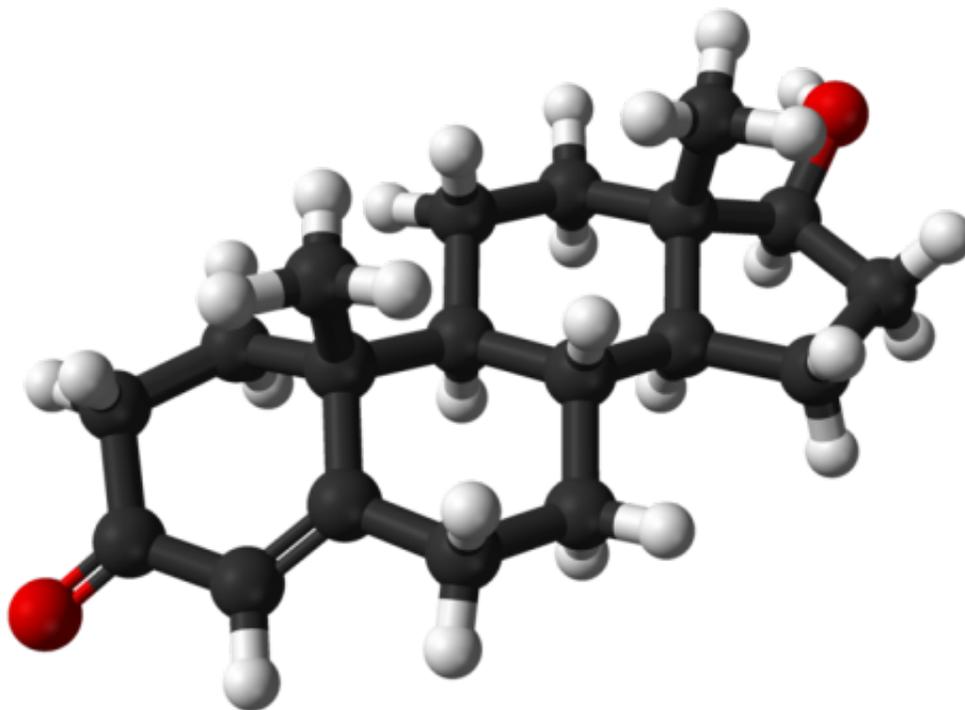


# Inflammatory diet linked to testosterone deficiency in men

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Ball-and-stick model of the testosterone molecule,  $C_{19}H_{28}O_2$ , as found in the crystal structure of testosterone monohydrate. Credit: Ben Mills/Wikipedia

Consuming a diet high in pro-inflammatory foods—including foods that contain refined carbohydrates and sugar as well as polyunsaturated fats—may be associated with increased odds of developing testosterone deficiency among men, suggests a study in *The Journal of Urology*,

Official Journal of the American Urological Association (AUA).

The risk of [testosterone](#) deficiency is greatest in men who are obese and consume a refined [diet](#) that scores high on the dietary inflammatory index (DII), according to the new research by Qiu Shi, MD, Zhang Chichen, MD, and colleagues of West China Hospital, Sichuan University, Chengdu, Sichuan Province, China. "While these findings do not prove causation, they do support previous research suggesting a pro-inflammatory diet can contribute to testosterone deficiency, among other potentially debilitating health issues," Drs. Qiu and Zhang comment.

### **Does diet influence testosterone levels? New study discovers link**

Testosterone is a male sex hormone that plays important roles in reproduction and sexual function. However, 20 to 50 percent of US men have testosterone deficiency—defined as a testosterone level less than 300 ng/dL (nanograms per deciliter). Symptoms of testosterone deficiency may include low libido, decreased energy, poor concentration and depression. Testosterone deficiency is also associated with chronic diseases, including cardiovascular disease and obesity.

Human and animal studies have linked testosterone deficiency with increased levels of inflammation in the body. Men with low testosterone have higher levels of pro-inflammatory cytokines: small proteins released by cells during injury, infection or in response to inflammatory factors in the environment. The DII has emerged as a tool for assessing the inflammatory potential of a person's diet, particularly in relation to other markers of health.

The researchers studied the association between the DII and testosterone deficiency in 4,151 men from the National Health and Nutrition Examination Survey, all of whom completed a 24-hour dietary interview and underwent sex hormone testing. Each participant's DII was

calculated based on the dietary history interview.

Calculated DII scores ranged from -5.05 (most anti-inflammatory) to +5.48 (most pro-inflammatory). Average total testosterone level was 410.42 ng/dL in men with the most pro-inflammatory diet versus 422.71 ng/dL in those with the most anti-inflammatory diet. Overall, about 26 percent of the men had testosterone deficiency.

For men with the most pro-inflammatory diet, the odds of testosterone deficiency were about 30 percent higher compared to men with the most anti-inflammatory diet. The associations remained significant after adjustment for other characteristics, including body mass index and smoking.

In a fully adjusted analysis, the risk of testosterone deficiency was greatest in men who were obese and had a higher DII. For this group, the odds of testosterone deficiency were nearly 60 percent higher compared to men with obesity who had a lower DII.

Drs. Qiu, Zhang, and coauthors note some important limitations of their study, including the fact that the DII was calculated based on a limited number of anti-inflammatory and pro-inflammatory food parameters.

"Our results suggest men who eat a pro-inflammatory diet, particularly those who are obese, are more likely to have testosterone deficiency," Drs. Qiu and Zhang comment. "Since men with obesity likely already experience chronic inflammation, physicians should be aware of contributing factors, like diet, that could likely worsen this inflammation and contribute to the risk of other health conditions, such as diabetes and heart disease."

Drs. Qiu and Zhang and colleagues call for further studies to verify the causal relationship between DII and testosterone deficiency. They also

suggest that consuming a more anti-inflammatory diet "could be a feasible method to reduce the accumulated inflammatory burden, [potentially] leading to an increased testosterone level."

**More information:** Chichen Zhang et al. The Association between Dietary Inflammatory Index and Sex Hormones among Men in the United States, *Journal of Urology* (2021). [DOI: 10.1097/JU.0000000000001703](https://doi.org/10.1097/JU.0000000000001703)

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