



ABSTRACT

Yogurt in the prevention of diabetes mellitus

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Yogurt, a popular fermented dairy product, is lauded for its nutritional benefits and role in promoting gut health. Recent studies have highlighted its potential in preventing chronic diseases, including type 2 diabetes mellitus (T2DM). This abstract delves into the mechanisms through which yogurt exerts its beneficial effects and explores how its regular consumption may contribute to diabetes prevention. Yogurt is rich in essential nutrients such as calcium, vitamin D, protein, and probiotics. The probiotics, particularly strains of *Lactobacillus* and *Bifidobacterium*, play a crucial role in maintaining gut microbiota balance. These live bacteria contribute to improved digestion and enhance immune function, pivotal in managing and preventing metabolic disorders like T2DM.

The human gut microbiota significantly influences metabolic health. Dysbiosis, an imbalance in the gut microbial community, has been linked to insulin resistance, inflammation, and the development of T2DM. Regular consumption of yogurt helps restore and maintain a healthy gut microbiota. The probiotics in yogurt enhance the production of short-chain fatty acids (SCFAs) like butyrate, which improve gut barrier function and reduce systemic inflammation. This, in turn, can enhance insulin sensitivity and glucose metabolism, lowering the risk of developing T2DM. Chronic low-grade inflammation is a known contributor to insulin resistance and T2DM. Yogurt contains bioactive peptides and probiotics that exert anti-inflammatory effects. These components help modulate the immune response and reduce the levels of pro-inflammatory cytokines. By mitigating inflammation, yogurt helps maintain normal insulin function and glucose homeostasis.

Yogurt has a low glycemic index (GI) and glycemic load (GL), making it a suitable food choice for maintaining stable blood sugar levels. The high protein content in yogurt and its probiotic composition slow down carbohydrate digestion and absorption, gradually increasing blood glucose levels. This glycemic control is essential for preventing spikes in blood sugar that can contribute to insulin resistance over time. Obesity is a significant risk factor for T2DM, and managing body weight is crucial in diabetes prevention. Yogurt can aid in weight management due to its high protein content, which promotes satiety and reduces overall calorie intake. Additionally, the probiotics in yogurt have been shown to influence fat metabolism and storage, contributing to reduced body fat. Consuming yogurt as part of a balanced diet can thus support weight loss and prevent obesity-related insulin resistance. Adequate intake of vitamin D and calcium, both abundant in yogurt, is associated with improved insulin sensitivity and reduced risk of T2DM.

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Vitamin D plays a role in pancreatic beta-cell function and insulin secretion, while calcium is involved in intracellular signaling pathways that affect glucose metabolism. Regular yogurt consumption ensures a steady supply of these nutrients, supporting metabolic health and reducing the likelihood of diabetes onset.

Numerous epidemiological studies and clinical trials have investigated the link between yogurt consumption and T2DM risk.

Several mechanisms underpin the protective effects of yogurt against T2DM: (1)Improved Gut Microbiota Composition: Probiotics in yogurt enhance the abundance of beneficial bacteria, improving gut health and reducing endotoxemia, which is linked to insulin resistance. (2)Enhanced SCFA Production: The fermentation of dietary fibers by probiotics increases SCFA production, which has anti-inflammatory and insulin-sensitizing effects. (3)Modulation of Immune Function: Yogurt's anti-inflammatory properties help maintain immune homeostasis, which prevents chronic inflammation associated with T2DM. (4) Glycemic Regulation: Yogurt's low GI and high protein content contribute to better glycemic control and reduced insulin resistance. (5)Nutrient Supply: Adequate vitamin D and calcium levels from yogurt support insulin function and glucose metabolism of blood flow and underlying pathology rather than treatment of the "lactic acidosis" per se..

Keywords: yogurt, diabetes mellitus, inflammation, immunology, prevention
