

**Mini Review**

# Navigating Weight Management with Stevia: Insights into Glycemic Control

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## Abstract

Stevia is a natural sweetener that has gained attention as a potential sugar substitute for glycemic control and weight management. Extensive research has shown that high sugar consumption is linked to obesity, dental caries, and other health issues. Stevia, derived from the *Stevia rebaudiana* plant, offers sweetness without calories and has a favorable glycemic profile. Studies have demonstrated its effectiveness in regulating blood glucose levels and reducing overall sugar and caloric intake. Consumer attitudes suggest a positive reception of Stevia as a sugar substitute among health-conscious individuals. However, further research is needed to understand its long-term effects and consumer sentiments. Future investigations should prioritize human clinical trials, targeted studies in diabetic populations, and exploration of Stevia's interaction with gut microbiota, among other aspects. Stevia shows promise as a health-conscious alternative in glycemic control and weight management.

## Introduction

The global concern surrounding high sugar consumption is underscored by its profound impact on human health. The shift towards “Westernized” dietary patterns has precipitated a notable rise in the intake of industrially processed foods, characterized by elevated levels of added sugar, starch, and fat, coupled with deficiencies in essential vitamins and fiber [1]. Extensive research has established a correlation between energy intake from various carbohydrate sources, particularly simple carbohydrates such as sugar, and the prevalence of obesity and overweight conditions [2]. Furthermore, there is a well-documented association between high sugar consumption and an increased risk of dental caries in children worldwide [3]. Notably, ultra-processed food and beverage products, notorious for their high sugar content, have been identified as significant contributors to weight gain and the heightened risk of numerous noncommunicable diseases [4]. In response to this critical issue, there is a growing consensus advocating for cohesive and impactful policies aimed at curtailing the consumption of ultra-processed foods and fostering healthier dietary habits on a global scale [4]. Addressing the challenge at hand, proponents recommend the implementation of health-promoting and supportive marketing strategies for nutritious foods. Additionally, the proposition of labeling healthy food items with a ‘health-friendly’ logo has been put forth as a potential strategy to combat the rising prevalence of obesity and dental caries [5].

### More Information

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**Submitted:** January 23, 2024

**Approved:** February 26, 2024

**Published:** February 27, 2024

**How to cite this article:** Kharat S, Mali S.

Navigating Weight Management with Stevia: Insights into Glycemic Control. *New Insights Obes Gene Beyond*. 2024; 8: 006-008.

**DOI:** 10.29328/journal.niogb.1001021

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**Keywords:** Stevia; Natural sweetener; Glycemic control; Weight management; Sugar substitute



## Stevia: Sweetness without calories

Stevia, a natural sweetener derived from the *Stevia rebaudiana* plant native to Paraguay and Brazil, goes by various names such as sweet leaf of Paraguay, honey leaf, candy leaf, and sweet weed [6]. The leaves of the stevia plant, boasting a sweetness level 10 times greater than refined sugar, remarkably contain no carbohydrates or calories [6]. This sweetness is attributed to steviol, a diterpenoid glycoside found in the plant, which is considered safe when employed as a sweetening agent [6,7]. Key properties and benefits of stevia encompass its exceptional sweetness, being 300 times sweeter than sucrose, and its safety, making it a suitable choice for diabetic and obese individuals [6]. Moreover, stevia exhibits a range of health benefits, including antibacterial, antiseptic, anti-inflammatory, antihypertensive, diuretic, and cardiogenic effects [6,7]. It has demonstrated the ability to regulate blood glucose levels by enhancing insulin secretion and utilization in insulin-deficient animals [6]. Additionally, stevia has been reported to contribute positively to skin health, showing efficacy in addressing issues such as acne, dermatitis, and eczema [6]. As a natural sweetener, stevia presents a healthier alternative to refined sugar when incorporated into various food and beverage products [7].

## Impact on glycemic control

A study conducted on Indian adults aimed to assess



the efficacy and safety of substituting added sugar with a stevia-based tabletop sweetener. The findings revealed a noteworthy reduction in weight and waist circumference among overweight subjects, and a significant decrease in weight accompanied by a non-significant change in HbA1c in overweight prediabetic individuals. Importantly, no adverse outcomes were reported throughout the study [8]. Stevia has demonstrated its capacity to regulate blood glucose levels by augmenting insulin secretion and utilization in insulin-deficient animals [6]. In vitro and in vivo investigations have further indicated that stevia exhibits antiglycemic action and may potentially confer benefits to the host's gut microbiota [9]. Moreover, a modest-scale study exploring the impact of stevia on food intake, satiety, and blood glucose levels found no significant differences in energy intake at lunch between water, sugar, and stevia preloads [10]. Existing research underscores stevia's potential to regulate blood glucose levels, with its reported hypoglycemic properties positioning it as a viable alternative sweetener for individuals grappling with hyperglycemia and adhering to stringent dietary requirements [7]. Stevia, with its ability to lower appetite sensation and avoid exacerbating food intake and postprandial glucose levels, emerges as a promising tool in the prevention and management of obesity and diabetes [14]. These studies suggest that stevia holds promise as a suitable sugar substitute for managing blood glucose levels, reducing sugar and caloric intake, and potentially offering benefits for conditions like obesity and diabetes. However, further research is essential to gain a comprehensive understanding of the long-term effects of Stevia on glycemic control and its broader impact on health.

### Stevia vs. Traditional sweeteners

Studies indicate that Stevia possesses a lower glycemic impact in comparison to traditional sweeteners like sugar and artificial substitutes. The regulation of blood glucose levels through enhanced insulin secretion and utilization in insulin-deficient individuals is a notable attribute of Stevia [11]. In a small-scale study examining Stevia's effects on food intake, satiety, and blood glucose levels, no significant differences in energy intake at lunch were observed between water, sugar, and Stevia preloads [10]. An additional study delved into the impact of Stevia and L-carnitine on the glycemic index (GI) and glycemic load (CG) of a nutritional supplement in healthy subjects. Results indicated a lower increase in the area under the glucose curve (IAUC) for the supplement containing Stevia and L-carnitine compared to reference products [12]. Importantly, Stevia is deemed safe for diabetic and obese individuals, and its potential benefits extend to the later stages of type 2 diabetes [6]. These findings collectively suggest that Stevia holds promise as a natural alternative to traditional sweeteners for individuals with diabetes. Its ability to regulate blood glucose levels and reduce overall sugar and caloric intake positions it as a potentially valuable tool in managing glycemic control.

### Consumer acceptance and practical considerations

While Consumer attitudes towards Stevia as a sugar substitute for glycemic control and weight management have not been extensively studied, a study involving health-educated individuals revealed that a majority of respondents exhibited favorable acceptance of Stevia as a sugar substitute. Moreover, they expressed a willingness to continue using it due to its perceived health benefits [13]. Another study focused on evaluating the efficacy and safety of a Stevia-based tabletop sweetener among overweight subjects with normal blood sugar levels and overweight prediabetic individuals. The results showcased a significant reduction in weight and waist circumference in both groups, suggesting that Stevia holds promise as a natural alternative to sugar for individuals managing diabetes and those seeking alternative sweeteners for health reasons [8]. These findings imply that Stevia could be well-received as a sugar substitute by individuals aiming to manage their glycemic control and weight. Nevertheless, further research is essential to delve into consumer attitudes towards Stevia and to comprehend its potential long-term impact on health.

### Future directions

Future research directions to enhance our understanding of Stevia's impact on glycemic control and weight management could encompass the following avenues:

**1. Human clinical trials:** Undertaking randomized clinical trials in human populations to delve deeper into the effects of Stevia on glycemic control, weight management, and its enduring influence on health [9,8].

**2. Diabetic population studies:** Conduct targeted studies on individuals with diabetes to validate the glycemic impact of Stevia and explore its potential benefits for this specific population [12].

**3. Gut microbiota interaction:** Further exploring the repercussions of Stevia consumption on the host's gut microbiota, including potential benefits on the microbiome's alpha diversity and the alterations in the colonic microenvironment resulting from Stevia intake [9].

**4. Anti-inflammatory properties:** Continuing research on the anti-inflammatory properties of Stevia, encompassing its effects on the synthesis of pro-inflammatory cytokines and transcription factors [9].

**5. Satiety and energy intake:** Undertaking additional studies to investigate the effects of Stevia on satiety, energy intake, and postprandial blood glucose levels. This approach can provide deeper insights into Stevia's role in regulating appetite and controlling blood sugar levels [12,14].

These proposed research directions aim to build upon existing knowledge and address key aspects of Stevia's potential impact on health, with a focus on glycemic control and weight management.

## Conclusion

In conclusion, the global surge in sugar-related health concerns has prompted a critical examination of alternative sweeteners, with Stevia emerging as a promising natural solution. The comprehensive analysis presented herein underscores Stevia's potential impact on glycemic control and weight management. Existing studies reveal encouraging results, demonstrating Stevia's effectiveness in regulating blood glucose levels and contributing to weight loss, particularly in overweight and prediabetic individuals. Comparative evaluations against traditional sweeteners highlight Stevia's favorable glycemic profile. Consumer attitudes, albeit not extensively studied, suggest a positive reception, indicating its acceptance as a sugar substitute among health-conscious individuals. However, a nuanced understanding of long-term effects and widespread consumer sentiments necessitates further research. Future investigations should prioritize human clinical trials, targeted studies in diabetic populations, exploration of Stevia's interaction with gut microbiota, assessment of its anti-inflammatory properties, and deeper insights into satiety and energy intake dynamics. These avenues promise to advance our understanding and substantiate Stevia's potential role as a health-conscious alternative in glycemic control and weight management.

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