

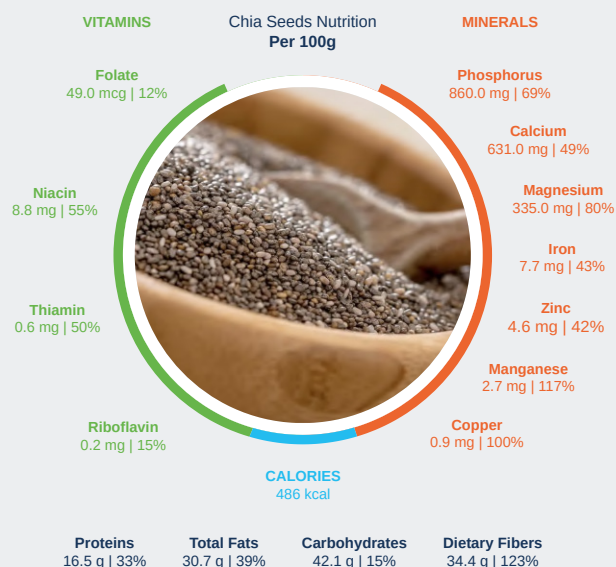
Health & Nutrition Sciences

Impact of a Low Dose of Chia Seeds on Satiety and Glycemic Control in Healthy Individuals

Chia seeds (*Salvia hispanica* L.), incorporated into cookies, reduce postprandial glycemic variability, but have little or no effect on subjective appetite¹

Chia is a nutrient dense ingredient

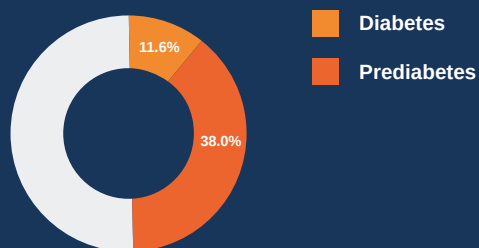
- Originated in Central America
- Chia seeds are a superfood that are high in dietary fiber, low in simple carbs, and good sources of healthy fats ω -3 FA (α -linoleic acid), protein, and micronutrients²
- Chia attracted interest as a functional food with positive effects on health and wellbeing^{3,4}
- Chia seeds can increase satiety, reduce food intake, and post-prandial glycemic response⁵



**Based on the reference caloric intake of 2,000 calories for adults and children aged 4 years and older

How Chia can help control risk

Obesity has a well-established link with poor glycemic control which could lead to diabetes and CVD risk.



- At least 38 million Americans (11.6%) have diabetes
- 38% of US adults are at risk (prediabetics)⁴
- A diet rich in whole grains and dietary fibers can help suppress hunger and slow down glucose or sugar absorption

The fibers and protein in Chia seeds may help in weight management.



The soluble fibers in chia can absorb 12 times their mass. Increase in seeds volume (swelling) with higher viscosity of gastric content, can increase satiety, fullness and delay glucose absorption.⁶

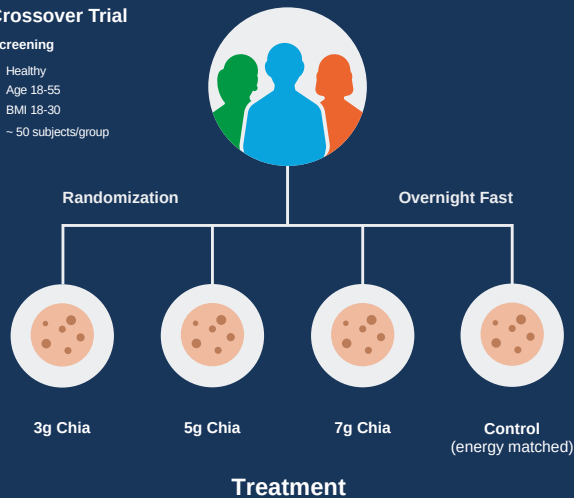
Dose response study with Chia seed

- Conducted a clinical study in healthy adults to test the lower effective dose of chia seed for satiety and glucose response
- Participants consumed a cookie containing 3, 5 and 7g of Chia compared to an isocaloric cookie control with no Chia

Crossover Trial

Screening

- Healthy
- Age 18-55
- BMI 18-30
- ~ 50 subjects/group



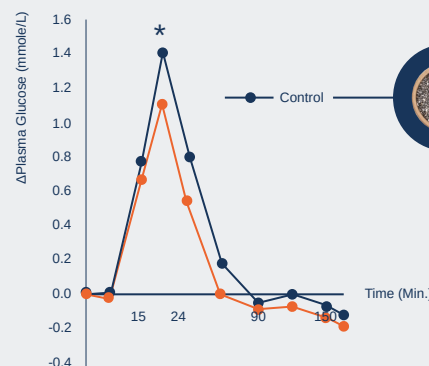
No major differences in satiety measures of chia seeds compared to control

- Chia in cookies has little effect on subjective measures of satiety
- 7g of Chia was the lowest effective dose for satiety
- However, the 7g presented processing challenges and issues with product taste and texture

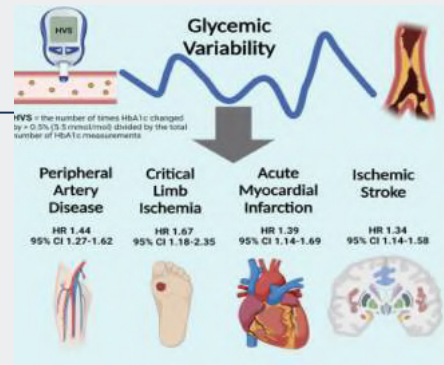
Chia can help improve glycemic control

- The 3 doses of Chia significantly lower the glycemic response by up to 30% compared to control
- Chia reduced the glucose response variability a measure of better glycemic control

Chia Slows Glucose Rise



* $p < 0.05$, peak and AUC



Hsu et al. 2023, <https://doi.org/10.1016/j.jacc.2023.03.101>

Conclusion: The data presented in this publication indicated that Chia added to cookies (30 g, 140 Kcal) have little effects on satiety measures, but elicited a significantly better glycemic response, which is relevant for glycemic control in diabetic or prediabetic individuals.

References:

1. Wolever et al. 2023 Chia seeds (*Salvia hispanica* L.), incorporated into cookies, reduce postprandial glycaemic variability but have little or no effect on subjective appetite <https://doi.org/10.1016/j.jff.2023.105806>.
2. Khalid et al. 2022 Chia seeds (*Salvia hispanica* L.): A therapeutic weapon in metabolic disorders. Food Sci. Nutri. doi: 10.1002/fsn3.3035V
3. Ayaz et al. (2017). Chia seed (*Salvia hispanica* L.) added yogurt reduces short-term food intake and increases satiety: Randomized controlled trial. Nutrition Research and Practice, 11(5), 412–418. <https://doi.org/10.4162/nrp.2017.11.5.412>
4. Ho et al. (2013). Effect of whole and ground Salba seeds (*Salvia Hispanica* L.) on postprandial glycemia in healthy volunteers: A randomized controlled, dose-response trial. European Journal of Clinical Nutrition, 67(6), 786–788. <https://doi.org/10.1038/ejcn.2013.103>
5. <https://www.cdc.gov/diabetes/data/statistics-report/index.html>
6. Vuscan et al. 2010 Reduction in postprandial glucose excursion and prolongation of satiety: possible explanation of the long-term effects of whole grain Salba (*Salvia Hispanica* L.) DOI: 10.1038/ejcn.2009.159