

An Overview of Chia Seeds and Their Nutritional Value

*Rahul Yadav, Mukesh Bhatheshwar, Rakesh Choudhary, Vikash Yadav and Naveen Lamror

M.Sc. Scholar, CoA, Nagaur, AU, Jodhpur, Rajasthan, India

Corresponding Author's email: rahulyadav950962@gmail.com

In order to prevent several ailments associated with civilization, including obesity, diabetes, and cardiovascular disease, adequate diet is essential. Nutritional recommendations are issued by both governmental and non-governmental organizations to safeguard human health, prevent the onset of certain diseases, and lessen their symptoms. Bioactive food ingredients are thought to play an increasingly significant role in boosting health. Biesalski and colleagues classified them as nutritional components or non-nutritional substances that are either naturally present in the raw material or created in the product during technological processes and have the potential to improve, impede, or alter an organism's physiological and metabolic processes. (Kulczyński, B et al. 2019)

These days, the prevalence of non-communicable diseases like diabetes, cancer, and heart disease is rising more quickly. Non-communicable illnesses account for two out of every three fatalities worldwide each year. Additionally, despite their exceptional medicinal qualities, the use of traditional crops has decreased over time. Chia seeds can be added to processed and ready-to-eat foods like maize extrudates to help use innovative ingredients for positive organoleptic qualities and health advantages. (Agarwal, A et al 2023)

Chia seeds are gaining popularity among experts due to its nutritional makeup and advantages for human health, according to current trends in better, nutrient-dense diets. According to reports, chia seeds include 15–25% protein, 15–35% fat, 4–6% ash, 18–35% dietary fiber, and 18–31% carbs. Additionally, protein-energy malnutrition (PEM) and micronutrient malnutrition (MNM) have both grown in a number of emerging nations, especially in youngsters. (Katunzi-Kilewela, et al. 2021)



Historical Aspects

Some species of *Salvia*, the most significant of which are *Salvia columbariae*, *Salvia hispanica*, and *Salvia polystachya*, are commonly referred to as chia. Carolus Linnaeus

(1707–1778) discovered *S. hispanica* growing wild in the New World and mistook it for a native plant from Spain, hence the name (Edwards, 1819). But once Hernán Cortés settled in Mexico, chia—which is indigenous to Mexico—was brought to Spain (Ortiz de Montellano, 1978). (Valdivia-López, et al 2015)

Nutritional compositions in Chia

Chia seeds supply 30–34 g of dietary fiber, of which 85–93% is insoluble and 7–15% is soluble. About 25%–40% of it is made up of polyunsaturated fatty acids (PUFA), of which 55%–60% are ω -3 fatty acids. The concentrations of oleic, palmitic, linoleic, and eicosapentaenoic acids (EPA) are reduced when the fatty acid profile is mostly stimulated by PUFA, particularly linolenic acid, which makes up about 60% of all fatty acids. When compared to other plant sources, chia seeds have the largest percentage of α -linolenic acid (18%–20%), which is the precursor of long-chain unsaturated fatty acids. These seeds also include a range of minerals, with the highest amounts of K⁺ (0.407–0.726 g/100 g), Mg⁺ (0.335–0.449 g/100 g), P (0.860–0.919 g/100 g), and Ca⁺ (0.456–0.631 g/100 g). A few vitamins were also found, including niacin (0.0088 g/100 g), vitamin B1 (0.0006 g/100 g), and vitamin B2. These seeds are also a great source of several phytochemical components that have unique biological effects. (Biswas, S., et al 2023)

Present Scenario of Chia Crop in Rajasthan

Chia seeds have been available in health and lifestyle stores in the country's metros, having been imported from Mexico. In India, the newly introduced crop is gaining importance in few states of the country viz., Rajasthan, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh and Karnataka. (Anand, S. R., et al 2024).

In agroclimatic zone IA (Arid Western Plains Region), Rajasthan, the experiment was carried out in 2017–18 and 2018–19 at the Agricultural Research Station, Mandor, Jodhpur. The region is at a height of 231 meters above mean sea level, it lies between latitudes 26°15' and 26°45' north and longitudes 73°00' and 73°29' east. Throughout the growth season, the average daily maximum and minimum temperatures ranged from 21.9 to 39.1 °C and 10.3 to 24.2 °C, respectively. During that time, the average daily humidity ranged from 12.7% to 76.6%. Chia crop took 120 days to mature.

The ideal time and distance for planting chia in Western India. A 30 × 30 cm chia crop can be planted between October 15 and October 25. agricultural geometry to increase seed and oil yield under comparable Rajasthani and Indian circumstances. The results will aid in the creation of an appropriate set of practices for chia across the nation. (Ram, M., et al 2024)

Conclusion

In the recent years, great advancement of Chia seed research has been observed in literature in regard to the nutritional properties, phytochemical analysis and genomic research. On the basis of current research findings, Chia seed contain massive nutritional and medicinal properties, for which it offers a great future potential for feed, food, medical, pharmaceutical and nutraceutical sectors. However, a detail in vivo and clinical studies of the safety. (Deka, R., & Das, A. 2017).

References

1. Kulczyński, B., Kobus-Cisowska, J., Taczanowski, M., Kmiecik, D., & Gramza-Michałowska, A. (2019). The chemical composition and nutritional value of chia seeds—Current state of knowledge. *Nutrients*, 11(6), 1242.
2. Agarwal, A., Rizwana, Tripathi, A. D., Kumar, T., Sharma, K. P., & Patel, S. K. S. (2023). Nutritional and functional new perspectives and potential health benefits of quinoa and chia seeds. *Antioxidants*, 12(7), 1413.
3. Katunzi-Kilewela, A., Kaale, L. D., Kibazohi, O., & Rweyemamu, L. M. (2021). Nutritional, health benefits and usage of chia seeds (*Salvia hispanica*): A review. *African Journal of Food Science*, 15(2), 48-59.

4. Valdivia-López, M. Á., & Tecante, A. (2015). Chia (*Salvia hispanica*): A review of native Mexican seed and its nutritional and functional properties. *Advances in food and nutrition research*, 75, 53-75.
5. Biswas, S., Islam, F., Imran, A., Zahoor, T., Noreen, R., Fatima, M., & Asif Shah, M. (2023). Phytochemical profile, nutritional composition, and therapeutic potentials of chia seeds: A concise review. *Cogent Food & Agriculture*, 9(1), 2220516.
6. Anand, S. R., RAO, A. M., & JAIN, J. A. (2024). Chia (*Salvia hispanica* L): A Nutri-rich Potential Crop, its present Scenario and Future Perspectives in India. *Mysore Journal of Agricultural Sciences*, 59(2).
7. Ram, M., Meena, R. C., Ambawat, S., Bhardwaj, R., Kumar, M., Meena, D. S., & Choudhary, S. (2024). Chia (*Salvia hispanica* L.) production potential in western India influenced by planting date and crop geometry. *International Journal of Research in Agronomy*, 7(1), 277-282.
8. Deka, R., & Das, A. (2017). Advances in chia seed research. *Adv. Biotech. Micro*, 5, 555661.