

## A review on Christmas nuts: Nutritional, Cultural, and Health Perspectives

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**ABSTRACT**

Christmas nuts have cultural and nutritional significance among different communities throughout the world. There are different kinds of nuts associated with Christmas viz. pecans, walnuts, chestnuts, hazelnuts, and almonds, and each of these have numerous health benefits, as well as minerals and vitamins. However, nut production is affected by intrinsic and extrinsic factors. In this review, current information on these nuts will be presented. This information will include nutrition composition, health effects and research gaps related to Christmas nuts.

**KEYWORDS:** Christmas nuts, heart health, metabolic function, fibre, nut production

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### 1. INTRODUCTION

In Europe, North America, and parts of Asia, nuts are part of winter and Christmas traditions. Since Christmas nuts are connected to seasonal availability, their place in festive customs have been continued for centuries. In general, people gather and share Christmas nuts during celebrations. Scientifically and nutritionally, Christmas nuts are appreciated because of their nutrient consistency, which contains vitamins, minerals, unsaturated fatty acids, and antioxidants (Ros, 2010). The antioxidants play a significant role in supporting heart and metabolic health (Ros, 2010). However, although nuts have a strong nutritional profile, there's still a need to balance their nutrient composition with health concerns - like allergies - as well as sustainability setbacks of water utilisation and environmental pressure involved in nut production (Volpe *et al.*, 2015).

### 2. THE NUTRITIONAL FEATURES OF CHRISTMAS NUTS

Christmas nuts contain many beneficial compounds. These compounds are unsaturated fats, dietary fibre, vitamin B, magnesium, copper, and several other elements. In Pecan and walnuts, antioxidants have been found to reduce oxidative stress, thereby improving cardiovascular health (Balakrishna *et al.*, 2022). Epidemiological and clinical studies have shown that the daily consumption of nuts improves lipid profiling, and this results in a reduction of risks underlying cardiovascular disease (Balakrishna *et al.*, 2022). Therefore, this highlights the need to consume nuts daily as part of a dietary plan.

### **3. THE CHARACTERISTICS OF INDIVIDUAL NUT TYPES**

#### *3a. Castanea sativa*

*Castanea sativa*, also known as the Chestnut, differs from other nuts, because they contain more carbohydrates than fat. In fact, the lipid content of *Castanea sativa* nuts are very low. In addition to carbohydrates, chestnuts also contain dietary fibre and starch. Santos *et al.* (2022) suggest that chestnuts contain vitamin C, and that a lower concentration of vitamin C is obtained from them after roasting. A potential setback with chestnuts is that storage and handling of them is problematic, because they are prone to mould and insect damage due to their high moisture content. In contrast, however, gluten-free chestnut flour is used in baking as it contains a unique sweetness and distinct texture. From this it can be gathered that chestnuts play a role as a functional alternative to grain-based diets, as well as, a culturally-festive source of nutrient-rich food.

#### *3b. Juglans regia*

*Juglans regia*, also known as walnuts, is associated with cardiovascular health benefits and anti-inflammatory effects. Walnuts are capable of instigating these effects as they contain plant-based omega-3 fatty acids, that house alpha-linolenic acid (Ros, 2010). Kris-Etherton *et al.* (2023) suggest that walnuts also improve inflammation markers and assist in neuroprotective mechanisms in aging populations. Therefore, among the Christmas nuts, walnuts is regarded as one of the most beneficial for heart care and brain function.

#### *3c. Corylus avellana*

*Corylus avellana*, also known as hazelnuts, contain high concentrations of vitamin E and monounsaturated fats. In Europe, hazelnuts have been found to cause tree-nut allergies. Scientifically, Cor a1 and Cor a9 proteins have been discovered in the initiation of allergic responses in people. However, these proteins have the potential to assess the severity of allergic responses, implying that it may help clinicians to differentiate between pollen allergies and tree-nut-related allergies (Camus-Ela *et al.*, 2025). Therefore, hazelnuts have allergenic complexity, which contributes toward clinical concerns and nutritional benefits in society.

#### *3d. Prunus dulcis*

*Prunus dulcis*, also known as the almond, is a nut that's consumed widely throughout the year. However, due to them being a traditional confectionary, they have become more popular during the Christmas season. Scientific evidence suggests that almonds may play a role in improving cholesterol profiling, and that it supports weight management by improving safety (Singar *et al.*, 2024) . Therefore, their versatility and nutritional value adds to their popularity in everyday diets and festive meals.

#### *3e. Carya illinoensis*

*Carya illinoensis*, also known as the pecans, possess a high polyphenolic content. This contributes toward their widespread antioxidant potential. Atanasov *et al.* (2018) reports that their use as a source of functional bioactive extracts, particularly pecan shells, contribute toward their health use - especially in the treatment of inflammation and bacterial infections. Therefore, pecans are a type of nutritionally valuable nut.

### **4. ALLERGIC REACTIONS CAUSED BY NUTS**

Tree-nut allergies are not a new phenomenon. McWilliams *et al.* (2015) reports that approximately 1-3 % are affected by health problems in some regions. The symptoms associated with tree-nut allergies are anaphylaxis, and itches. This highlights the need to label nut-containing foods during the festive season, as it serves as a protective mechanisms in protecting the public. This is particularly important since nuts are often shared during the festive period. Camus-Ela *et al.* (2025) have identified the use of protein components, as mentioned earlier, to manage allergies concerning nuts. However, public awareness and education on this factor is still lacking.

### **5. THE PROCESSING, STORAGE AND SHELF-LIFE OF CHRISTMAS NUTS**

The nutritional quality and safety of nuts are dependent of the quality of seed processing and storage. Fat oxidation poses a huge threat to pecans and walnuts, and therefore proper storage is needed to prevent rancidity. On the other hand, chestnuts are prone to spoilage with unfavourable environmental conditions.

Therefore, in the case of chestnuts, controlled humidity and temperature conditions are required to protect the seeds. As already mentioned, heat-sensitive antioxidants may be diminished due to roasting (Balakrishna *et al.*, 2022). Therefore, in order to improve nut shelf life and quality, 3 factors are needed to be controlled. These 3 factors are 1. controlled storage atmosphere, 2. mild heating, and 3. better packaging methods.

## 6. COMMENTARY ON A BRAZILIAN STUDY

In a study performed in Brazil it was found that the inclusion of Brazilian nuts during the festive season coincided with the traits these nuts possess, particularly their nutritional and health benefits. In Brazil, nuts are culturally valued as a food that's consumed on a 'special occasion', because they are scarce and large in size. This study found that even a small serving of Brazilian nuts were sufficient to cause an increase in blood serum selenium levels. Selenium has been found to participate in antioxidant defence and thyroid function. In addition, the researchers found that when one or two nuts are consumed per day, glutathione peroxidase activity is improved, while reducing the activity of oxidative stress markers. This highlighted that although Brazilian nuts are consumed occasionally, health benefits are still measurable. However, the researchers have warned that overconsumption of these nuts could result in selenium overconsumption, thereby making holiday eating worthwhile (Cominetti *et al.*, 2012)

### What about nut sustainability?

Nut sustainability is affected by where they are grown as well as the management practices employed. Volpe *et al.* (2015) states that almond productivity is most affected in drought-prone areas because they require large water requirements to be grown properly. In contrast, however, these authors also report that all nut orchards require healthy pollinators and proper land investments to ensure progressive nut production. Nevertheless, nut orchards also provide a long-lived perennial system. This system stores carbon and, therefore, supports sustainable biodiversity. Pollinator habitat protection, orchard management, and drip

irrigation plays a role in reducing environmental impact on the growth of nuts.

### Conclusion and perspective

Christmas nuts combine festive and traditional significance with nutritional value. As we have read, nuts have various nutritional properties, e.g. walnuts and almonds have been proven to support heart health, whereas chestnuts have carbohydrate-based nutritional benefits. Due to allergenicity, hazelnuts require careful management. Pecans, on the other hand, provide promise for bioactive compound studies. In the quest for sustainable nut production, scientists are currently discussing methods of analyzing nut life-cycle changes, as well as, exploring agricultural management possibilities so that advanced studies on nut sustainable can be further pursued.

In my opinion, a crucial account needs to be envisaged to address socioeconomic and accessibility factors. In this way, nuts may become equitable across populations. Also, intervention trials during the festive season may assess how a person's overall diet quality may be impacted by substituting nuts with an energy-dense snack.

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