



Pecannut and its Health Benefits

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Pecan nut is the one of the most important temperate nuts grown in India. In India, it is mainly grown in Jammu and Kashmir, and Himachal Pradesh. The total area under pecan nut production is increasing due its high economic returns and adaptation to intermediate zone of Jammu. Most plantations are of seedling origin in scattered form and produce nuts of variable quality. Pecan nut is one of the important nut crops of the world occupying fifth position among the tree nuts. The name "pecan" came from Algonquin Indian word 'pacaan'. The botanical name of Pecan is (*Carya illinoensis*) and belongs to the family Juglandaceae (Curiel-Macielet *et al.*, 2021). A pecan, like the fruit of all other members is not truly a nut but is technically a drupe, a fruit with a single stone or pit, surrounded by a husk. The husks are produced from the exocarp tissue of the flower, while the part known as the nut develops from the endocarp and contains the seed. The husk itself is aeneous, that is, brassy greenish-gold in colour, oval to oblong in shape, 2.6–6 cm long and 1.5–3 cm broad. The outer husk is 3–4 mm thick, starts green, and turns brown at maturity, at which time it splits off into four sections to release the thin-shelled seed (Dominguez-Avila *et al.*, 2015). Pecan seeds are edible, with a rich, buttery flavour. They can be eaten fresh, roasted, or used in cooking, particularly in sweet desserts, such as pecan pie, cookies, cakes, and ice creams. Other applications of cooking with pecans include pecan oil and pecan butter. A pecan nut is 4% water, 72% fat, 9% protein, and 14% carbohydrates. Pecans are a moderate source (10-19% DV) of iron and B vitamins. Pecan fat content consists principally of monounsaturated fatty acids, mainly oleic acid (57% of total fat), and polyunsaturated fatty acid, linoleic acid (30% of total fat). Nutritionally, pecans are packed with healthy fats, particularly monounsaturated fats, which are beneficial for heart health. They are also a good source of protein, fibre, vitamins, and minerals, including manganese, magnesium, and zinc. Additionally, pecans contain antioxidants, which help protect the body against oxidative stress and inflammation. Pecans are a rich source of antioxidants, mono-unsaturated fatty acids (MUFAs) and several vitamins and minerals, and are thought to be associated with similar health improvements as other nuts. Therefore, replacing butterfat in breakfast meals with pecans could be beneficial in reducing chronic disease risk (Ferrari *et al.*, 2022).

Edible oil of Pecan is mainly used in manufacture of essential oils, cosmetics, drugs and paints. Pecans are high-energy value (691 kcal/100 g) health food consisting of approximately 9% protein, 72% lipid, 14% carbohydrate and 10% fibre. Nut is the fruit obtained from this tree, and one of its main attributes is its high oil content that can be up to 75% depending on growth conditions, maturity and variety nut. Nut oil is mostly composed by unsaturated fatty acids such as oleic (60-70%) and linoleic acid (up to 30%), and very low amounts of other fatty acids including palmitic, stearic and linoleic acids. The majority of Pecan lipids are monounsaturated (60%) and polyunsaturated fatty acids (32%), deficient in cholesterol and contain antioxidants and phytosterols which leads to a lower risk of cardiovascular and impart

dietary health benefits. They are also a rich source of minerals such as phosphorus, potassium, zinc, and iron and are naturally low in sodium. Pecan nuts (*Carya illinoensis*) provide a wide range of bioactive compounds (particularly polyphenols) that improve the nutritional quality of diets. Interestingly, pecan nuts (*C. illinoensis*) are considered nutritionally valued wellness nuts. Their consumption provides a large spectrum of phenolic compounds, including flavonoids, phenols, condensed tannins, flavanols, and o-diphenols. The high antioxidant potential of *C. illinoensis* is mainly attributed to the abundance of condensed tannins, phenols, and flavonoids. Pecan nut kernels contain high amounts of ellagic acid, catechin, and gallic acid that can effectively quench free radicals (Bouali et al., 2023).

The consumption of pecan nuts has risen with the growing interest of consumers in their great prophylactic and therapeutic effects, as they have been associated with a reduction in the risk of chronic diseases. In addition to polyphenols, pecan nut kernels contain moderate amounts of carbohydrates, which serve as energy sources, with sucrose being the most abundant one. Thus, overall pecans are among the nuts with low levels of carbohydrates, suitable for a low-sugar-intake diet (Aguilar et al., 2015).

Pecans are not only delicious but also packed with a variety of health benefits, making them a valuable addition to a balanced diet. Here are some of the key health benefits of pecan nuts:

1. Heart Health:

- Pecans are rich in monounsaturated fats, particularly oleic acid, which is known to support heart health. Consuming these healthy fats can help lower LDL (bad) cholesterol levels while increasing HDL (good) cholesterol, reducing the risk of heart disease.
- They also contain plant sterols, compounds that are effective in lowering cholesterol levels.

2. Rich in Antioxidants:

- Pecans are high in antioxidants, particularly vitamin E, ellagic acid, and flavonoids. These compounds help protect the body against oxidative stress, which is linked to chronic diseases such as cancer and heart disease.
- Antioxidants in pecans can also help reduce inflammation in the body, contributing to overall health and well-being.

3. Weight Management:

- Despite being calorie-dense, pecans can support weight management. The combination of healthy fats, protein, and fibre in pecans helps promote satiety, reducing the likelihood of overeating.
- The fibre content also aids in digestion and helps maintain stable blood sugar levels, which can prevent hunger spikes.

4. Blood Sugar Control:

- The low carbohydrate content and high fibre content of pecans make them a good choice for managing blood sugar levels. They have a low glycemic index, meaning they do not cause rapid spikes in blood sugar levels, which is beneficial for people with diabetes or those at risk of developing the condition.

5. Bone Health:

- Pecans are a good source of essential minerals such as manganese, magnesium, and phosphorus, which are crucial for maintaining strong and healthy bones. These minerals help with bone formation and prevent bone-related disorders like osteoporosis (Beuchat and Pegg 2013).

6. Brain Health:

- The healthy fats in pecans, along with vitamins like vitamin E, are beneficial for brain health. Vitamin E is known to protect the brain from oxidative stress, potentially reducing the risk of neurodegenerative diseases such as Alzheimer's.

- Pecans also contain choline, a nutrient that supports brain function and development.
- 7. Digestive Health:**
- The dietary fibre in pecans promotes healthy digestion by supporting regular bowel movements and preventing constipation. Fibre also plays a role in maintaining a healthy gut microbiome, which is essential for overall digestive health.
- 8. Skin and Hair Health:**
- The vitamins and antioxidants in pecans, particularly vitamin E, contribute to healthy skin and hair. Vitamin E helps protect the skin from oxidative damage, maintaining its elasticity and reducing the signs of aging. The nutrients in pecans also support strong, healthy hair growth.
- 9. Boosts Immune System:**
- Pecans contain zinc, a mineral that plays a crucial role in immune function. Adequate zinc intake is essential for the body's ability to fight off infections and maintain a strong immune response.
- 10. Arthritis relief:** Pecans also contain omega-3 fats, which can help ease the pain of arthritis by reducing inflammation. The magnesium, calcium, fibre, vitamin E, and zinc in pecans also give the nuts anti-inflammatory properties (Atanasov et al., 2018).

In conclusion, pecan nuts are a nutrient-dense food that offers a wide array of health benefits. rich in heart-healthy fats, antioxidants, vitamins, and minerals, they support cardiovascular health, aid in weight management, and promote overall well-being. Their ability to help manage blood sugar levels, boost brain function, and contribute to strong bones further underscores their value in a balanced diet. Whether enjoyed as a snack or incorporated into meals, pecans are a delicious and versatile way to enhance your health. Thus, incorporating pecans into your diet can offer numerous health benefits, making them a tasty and nutritious snack or ingredient in a variety of dishes.

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