

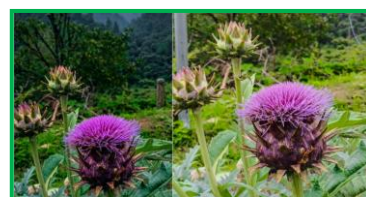
## Globe Artichoke as an Emerging Functional Food: Nutritional Composition and Health Benefits

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Globe artichoke (*Cynara cardunculus* L. var. *scolymus*) is a perennial Mediterranean vegetable cultivated for its edible immature flower buds. The tender receptacle and fleshy bracts are highly nutritious, rich in dietary fibre, essential vitamins, minerals and some bioactive compounds such as inulin and phenol (cynarin, chlorogenic acid, luteolin). These phytochemicals show antioxidant, hepatoprotective, hypolipidaemic, anti-inflammatory, prebiotic and cardioprotective effects. Consequently, globe artichoke is recognized as an important functional vegetable for traditional remedies, nutraceuticals and value-added health-promoting products.



### Introduction

Globe artichoke (*Cynara cardunculus* L. var. *scolymus*), is an ancient herbaceous perennial plant of the Asteraceae family. It is believed to have originated in the Mediterranean region. It is cultivated in many countries around the world like Italy, Egypt, Spain, Algeria and Peru having leading producers. This crop is widely grown for its large immature inflorescences, also named as capitula or heads which present the edible parts together with small stems and fleshy bracts and receptacle that are consumed as vegetables. The immature flowers buds are valuable for their high nutritional content and medicinal properties. Due to its high concentration of bioactive compounds, *C. cardunculus* acts as a functional food that helps maintain and improve human health. In recent years, it has attracted considerable interest as a functional food, owing to its rich content of polyphenols, inulin, fibre, vitamins, minerals and other bioactive compounds that contribute to both nutritional and medicinal value. According to Food and Agriculture Organization (FAO), global worldwide artichoke cultivation has shown consistent growth over the past ten years, rising from roughly 1.4 million tonnes to 1.9 million in 2019 (Food and Agricultural Organization, 2021).

### Nutritional Composition of Globe Artichoke

The edible heads of globe artichoke are low in calories yet rich in nutrients, edible flower bud that promote overall health. The consumable portion of this thistle plant offers a significant amount of dietary fiber, protein, essential vitamins and minerals.

### Major Nutritional Components

- **High dietary fiber:** Artichokes are an excellent source of dietary fiber, including inulin and pectins, supporting gut health, satiety and glycaemic control promoting healthy digestion, acting as a probiotic to improve gut health.

- **Vitamin:** Artichoke is a rich source of essential vitamins that play an important role in human health and metabolism. It contains significant amount of vitamins such as vitamin C, vitamin E and several B-group vitamins include B<sub>3</sub> (niacin), B<sub>6</sub> (pyridoxine), B<sub>8</sub> (Biotin), B<sub>9</sub> (folate) and it also provide Vitamin K, these are contributing to antioxidant defence mechanism, supports energy metabolism and proper tissue growth and development in human body.
- **Vitamin C (ascorbic Acid):** It functions as a potential antioxidant to protects cells from oxidative damage caused by free radicals and helps the immune system function properly. It also plays a crucial role in supporting immune system function and promote the collagen synthesis and tissue repair.
- **Vitamin K:** Vitamin K acts as a "bone traffic controller" by directing calcium to bones and ensuring blood coagulation and bone metabolism properly.
- **Vitamin B<sub>9</sub>:** Folate is essential for healthy tissue development, DNA synthesis, cell division, proper tissue development and genetic code maintenance. It particularly important for genetic stability and supporting normal growth and development.
- **Vitamin B<sub>6</sub>:** Vitamin B6 is involved in metabolism of proteins, fats, and carbohydrates for energy production. It also participates in neurotransmitters synthesis that regulate brain function and mood.
- **Mineral Powerhouse:** It provides several essential minerals required for physiological functions, including potassium, magnesium, calcium, phosphorus, and iron. These minerals are important for maintaining electrolyte balance, bone health, enzymatic activities, and oxygen transport in the body.
- **Rich source of Antioxidants:** Artichokes are filled with high levels of bioactive compounds particularly polyphenols and flavonoids such as cynarin and silymarin which exhibit strong antioxidant properties. These compounds help reduce oxidative stress by neutralizing free radicals and protecting cellular components from damage.
- **Nutrient-Dense & Low-Calorie vegetable:** Artichoke is characterized by a high nutrient density while being very low in fat and calories. This makes it a ideal choice for a balanced diet, providing high essential nutrients without excessive caloric intake.

### Bioactive Compounds in Globe Artichoke

Globe artichokes are rich in bioactive compounds such as polyphenols and flavonoids, which function as therapeutic agents to protect the body against disease.

- **Cynarin:** Cynarin is a bioactive caffeoylquinic acid derivative found in artichokes, recognized for its hepatoprotective (liver-protecting), hypocholesterolemic and antioxidant effects. It acts as a choleric agent that stimulates bile flow.
- **Chlorogenic acid:** A key compound for neutralizing free radicals, thereby preventing inflammation and tissue damage.
- **Flavonoids (luteolin, apigenin and derivatives):** flavonoids contribute to anti-inflammatory, cardioprotective and anticarcinogenic activities. Luteolin is a polyphenolic plant compound known for its tumor-suppressing and anti-swelling effects.
- **Inulin:** Inulin is a soluble plant-based fiber that acts as a prebiotic, nourishing beneficial gut bacteria to improved digestive function and microbiome health it helping to regulate blood sugar and lipid metabolism. Digestion and supports overall metabolic health.

These compounds occur not only in the edible heads but also in leaves, outer bracts and stems, which represent 70-85% of plant biomass and are increasingly viewed as valuable raw material for food additives and nutraceuticals rather than waste

### Medicinal Properties and Importance of Globe Artichoke

Extract of *C. cardunculus* widely promotes the liver health by enhancing bile production and supporting detoxification processes, thereby improving overall hepatic function, making it a valuable herbal remedy for liver function improvement. Regular intake helps manage cholesterol by reducing bad (LDL) and improving good (HDL) levels, supporting

cardiovascular health. Rich in antioxidants, it shields cells from oxidative stress and free radical damage. It aids digestion by stimulating bile flow and providing dietary fiber. In addition, it helps regulate blood sugar, aiding metabolic health. Moreover, its phytochemicals exhibit anti-inflammatory properties, which may help reduce the risk of various chronic diseases.

- **Liver Protection (Hepatoprotective Effect):** Extracts of artichoke exhibit hepatoprotective activity by stimulating bile production and enhancing detoxification pathways in the liver. These properties support normal hepatic function and have led to its use in traditional and herbal medicine for managing liver-related disorders.
- **Focus on Heart Health:** Consumption of globe artichoke extract has been shown to optimize lipid profiles- Reducing LDL (bad cholesterol) while supporting beneficial HDL (good cholesterol) thereby improving heart health.
- **Antioxidant Activity:** High antioxidant levels defend cells against free radical destruction, potentially lowering the risk of chronic illnesses like cancer and heart disease. These compounds neutralize harmful molecules to prevent cellular harm, thereby reducing long-term disease risk.
- **Digestive Health:** Artichokes support digestive wellness by encouraging bile production and offering high fiber content, helping to soothe indigestion and reduce bloating.
- **Glycemic control:** The presence of inulin, a soluble dietary fiber, helps regulate blood glucose levels by slowing glucose absorption and improving insulin sensitivity, thereby supporting metabolic health and benefiting individuals with diabetes.
- **Control the Blood Sugar:** Inulin acts as a functional fiber that slows glucose absorption and enhances insulin efficiency, supporting healthier blood sugar levels in diabetic patients.
- **Anti-inflammatory Effects:** Flavonoids and other bioactive compounds present in artichoke possess anti-inflammatory properties that may help reduce chronic inflammation associated with several metabolic and degenerative diseases.

### Scope for Functional Foods and Nutraceuticals

Due to its significant health benefits, the globe artichoke is widely utilized in functional foods and nutraceutical products. Artichoke extracts are frequently used in supplements to support liver function and lower cholesterol. Beyond the vegetable itself, artichoke components are used in herbal teas and capsules, and the food industry utilizes them as natural antioxidants and preservatives. These applications reinforce the importance of artichoke as both a vegetable and a valuable medicinal plant.

**Dietary supplements and herbal medicines:** It is Largely based on leaf extracts standardised for caffeoylquinic acids and flavonoids, used for liver support and lipid lowering.

**Functional foods:** Artichoke extracts or powders enrich bakery items, dairy products or beverages, adding fibre, inulin and natural antioxidants while improving shelf-life.

**Valorisation of by-products:** Transforming outer bracts, leaves and stems into high-value ingredients for nutraceuticals, food additives and cosmeceuticals, aligning with circular-economy approaches.

### Conclusion

Globe artichoke is much more than an exotic vegetable, it is a nutritional and medicinal powerhouse rich in fibre, inulin, vitamins, minerals and polyphenols. Its documented hepatoprotective, cardioprotective, antioxidant, anti-inflammatory and prebiotic effects firmly establish it as a functional food with wide potential in modern diets and health-oriented market. For Indian horticulture, systematic evaluation of suitable varieties, agro-techniques, post-harvest handling and processing options could open new avenues for farmer income, functional food development and nutraceutical innovation based on this ancient yet timely crop.