



## Bamboo shoots: Beneficial effects on health

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Bamboo shoot is considered as a traditional cuisine in different countries. As bamboo shoots content low fat, high potassium content, carbohydrate, vitamins and minerals etc., it is widely used by the people of India and outside. Bamboo shoots are consumed in different form. It is having good nutritional qualities as well as medicinal value. It is largely consumed by the tribes as they collect from the forest and consumed as a vegetable. The present article gives an insight how the indigenous bamboo shoots used as a food, as a medicine and various home decoration purpose. Modern research has revealed that bamboo shoots have a number of health benefits: improving appetite and digestion, weight loss, and curing cardiovascular diseases and cancer. The shoots are reported to have anticancer, antibacterial, and antiviral activity. Shoots have antioxidant capacity due to the presence of phenolic compounds. The increasing trends of health consciousness among consumers have stimulated the field of functional foods and bamboo shoots can be one of them. Bamboo fiber is now a common ingredient in breakfast cereals, fruit juices, bakery and meat products, sauces, shredded cheeses, cookies, pastas, snacks, frozen desserts, and many other food products..Due to modernization, the traditional forest products are extinct day by day. So it is very important to conserve the traditional food practices by aware the people about the importance of bamboo shoots by organize various campaign, workshop etc. in the community.

Bamboo shoots are the edible shoots of the bamboo plant and are usually harvested before they are two weeks old. The shoots have a tough exterior and a tender interior with a faintly sweet flavour. It is important to peel the bamboo shoots before using since they have a bitter taste and are difficult to digest. Bamboo shoots may be huge and thick and in many cuisines, it is first boiled in water till cooked and then sliced. These sliced bamboo shoots are further used in recipes as required. Bamboo shoots have high nutritional value and low fat, and are a good source of fibre. Bamboo shoots are rich in vitamins, cellulose and amino acids. At harvesting, a shoot may contain as much as 90 per cent water. The edible content of a newly harvested shoot is typically around 30 per cent; the balance is made up of the sheath, and the extreme portions of the shoot. Most bamboo species produce edible shoots. In many parts of India, bamboo shoots have formed a part of traditional cuisine – fresh, dried, shredded or pickled. There is however also a growing market for processed and packaged shoots, representing an opportunity for the establishment of commercially runs processing units.

**Bamboo shoots used as food :** Bamboo shoots or bamboo sprouts are the edible shoots (new bamboo culms that come out of the ground) of many bamboo species including *Bambusa vulgaris* and *Phyllostachys edulis*. They are used in numerous Asian dishes and broths. They

are sold in various processed shapes, and are available in fresh, dried, and canned versions.

Shoots of several species of bamboo are harvested for consumption:

- *Phyllostachys edulis* produces very large shoots up to 2.5 kilos. The shoots of this species are called different names depending on when they are harvested. Winter shoots are smaller in size, up to 1 kg in weigh per harvested shoot. The flesh is tender and palatable and commercially quite important. “Hairy” shoots are larger in size, but due to their toughness and bitter taste, they are generally used to make dried bamboo shoots.

- *Phyllostachys bambusoides* produces shoots that are slender and long with firm flesh. Commonly consumed fresh, they are also made into dried bamboo shoots.

- *Dendrocalamus latiflorus* produces shoots that are large with flesh that is fibrous and hard. As such, they are suitable mainly for canning and drying.

- *Bambusa oldhamii* produces valuable shoots that are large with tender and fragrant flesh. They are usually sold fresh and in season between late spring and early fall. Their availability depends on local climate. These shoot are also available in cans when not in season.

- *Bambusa odashimae* is considered similar to *B. oldhamii*, but highly prized due to its crisp flesh similar to

Asian pears. It is produced mainly in Taitung and Hualien and consumed fresh.

**Table 1 : Nutritional profile of raw bamboo shoots (USDA National Nutrient Database)**

Component	Value
Water	68.7 g
Calories	20Kcal
Protein	1.96 g
Carbohydrates	3.93 g
Fibre	1.7 g
Sugar	2.27 g
Total Fat	0.23 g
Saturated Fat	0.23 g
Monounsaturated Fat	0.005 mg
Poly unsaturated Fat	0.101 mg
Cholesterol	0 mg
Calcium	10 mg
Phosphorus	0.38 mg
Potassium	2 mg
Sodium	45 mg
Zinc	0.83 mg
Vitamin C	3 mg
Thiamine	0.113 mg
Riboflavin	0.053 mg
Niacin	0.453 mg
Pantothenic acid	0.112
Vitamin B6	0.181 mg
Folic acid	5 mcg
Vitamin A	15 I.U.
Vitamin E	0.76 mg
Phytosterols	14 mg
Betacarotene	9 mcg

Source: Rai (2007)

**Bamboo shoots used as medicine :** Modern research finds that the bamboo shoot has a number of medicinal benefits, from cancer prevention and weight loss to improving appetite and digestion. It is also low in sugar and therefore can be used for treating hypertension, hyperlipemia and hyperglycemia.

Japanese scientists recently discovered that bamboo shoots contain anti-cancer agents and making them a regular part of your diet effectively eliminates the free radicals that can produce dangerous carcinogens.

With the economic development and the improvement of people's living standards, demand for natural foods, especially organic food, has greatly increased. *Moso* bamboo does not contain toxic substances and its products are made in strict accordance with the food safety standards, so it is an ideal resource for natural foods.

### Health-enhancing properties :

– **Rich in nutrients:** Shoots have a high content of protein (amino acids), carbohydrate, minerals, and several vitamins (Chongtham *et al.*, 2011).

– **Function as nutraceuticals:** Nutraceuticals are ordinary foods with components or ingredients imparting a specific medical or physiological benefit other than a purely nutritional effect. Bamboo shoots contain phytosterols and a high amount of fiber that can qualify as “nutraceuticals” or “natural medicines.” Phytosterols have cholesterol-lowering activity (Brufau *et al.*, 2008).

– **High fibre content, almost no calories:** Bamboo shoots are a good source of edible fibre (6 to 8 g/100 g fresh weight), which helps in lowering the blood cholesterol. Dietary fibers are vegetable fibres obtained from fibre-rich parts of plants. They are neutral in taste and odor free and have no calories and fats. Bamboo fiber is available as a white powder with at least 95 per cent fibre. A number of companies market such fibre additives that are rich sources of dietary fibre (Chongtham *et al.*, 2011).

– **Low fat :** Fat content is extremely low in bamboo shoots (2.46 g/100 g) that are, therefore, very good for weight-conscious and dieting people (Chongtham *et al.*, 2011).

– **Appetizer :** The high cellulosic content of bamboo shoots stimulates appetite. Being crisp, crunchy, and tender with a sweet flavor, shoots have a unique and delicious taste that function as an appetizer (Chongtham *et al.*, 2011).

**Table 2 : Bamboo shoots and human health**

Potential activities on human health	Reference
Antioxidant and antiinflammatory effects of bamboo shoot extracts	Hu <i>et al.</i> (2000); Lu <i>et al.</i> (2005)
Antimicrobial and antifungal activities of bamboo shoot pyrolysates	Fujimura <i>et al.</i> (2005)
Protect neurons from oxidative stress	Akao <i>et al.</i> (2004)
Antiapoptotic activities of bamboo shoot-derived pyrolysates and as a supplement for ischemic injury treatment	Hong <i>et al.</i> (2010)
Anticancer, antibacterial, antiviral activity of bamboo shoot fibre	Shi and Yang (1992); Fujimura <i>et al.</i> (2005)
Antifatigue activity	Zhang <i>et al.</i> (2006)
Cholesterol lowering properties	Park and Jhon (2009)

Source: (Chongtham *et al.*, 2011).

**Beneficial properties of bamboo shoots :** Bamboo shoots are an exotic food that is consumed in many countries in Asia and now it is slowly picking up demand in the Western countries. Bamboo shoots are known for



Young Bamboo shoots (*Dendrocalamus stictus*)



Dried bamboo shoots (*Dendrocalamus stictus*)

their various health benefits.

**Help in losing weight :**

**Heart friendly:** According to research phytosterols and phytonutrients found in bamboo shoots are ideal for dissolving harmful LDL cholesterol in the body. Thus easing out arteries for smooth supply of blood throughout the body.

**Controls cholesterol:** Consumption of bamboo shoots is also helpful in decreasing LDL levels of cholesterol, with stable glucose levels. This was due to the fact that bamboo shoots contained negligible amounts of fat and very low calories. Research conducted by Park and Jhon at the Washington State University, showed that consumption of bamboo shoots had favourable effects on cholesterol, lipid and bowel function.

**Fights cancer:** Research studies on bamboos have indicated that leaves of bamboos consist of phytosterols such as flavones, amylase and chlorophyll. Out of these, chlorophyll showed properties of controlling mutations and cancer.

**Strengthening immune system:** The vitamins and

minerals in bamboo shoots are ideal for improving immune system. The vitamins, minerals and antioxidants present in bamboo shoots are essential in strengthening the body from the inside.

**High supply of dietary fibre:** The amount of dietary fibre in bamboo shoots is high. Consuming sufficient dietary fibre is essential for easy digestion and free bowel movement. Including bamboo shoots in dinner can be a very good idea to lose weight. With lack of any physical activity during night time, taking food with less calories and high fibre helps lose weight easily.

**Anti-inflammatory properties:** According to research conducted by Muniappan and Sundararai, bamboo shoots possess anti-inflammatory, and analgesic or pain-killing properties. It helps in healing of ulcers as well. Juice of bamboo shoots can also be used as a medicine for external wounds and ulcers.

**Stomach disorders:** Bamboo shoots are useful in treating stomach disorders. Apart from bamboo shoots, bamboo leaves are also suggested as a remedy for intestinal worms and stomach disorders as well.

**Wound cleaning:** Bamboo shoots are also used for cleaning wounds and sores.

**Lower blood pressure:** Bamboo shoots contain high amounts of potassium. Potassium is highly beneficial as an electrolyte and it is also very good for lowering and maintaining blood pressure.

**Conclusion :** Bamboo is a plant species that incorporates several economic, ecological and social benefits in the day to day life of human beings. Therefore, organized cultivation for bamboo shoot may be encouraged. This requires the use of a different package of practice which normally holds better soil, water and light conditions, and more intensive management. Plantation of the most edible and adventurous species, preferably *Dendrocalamus giganteus*, *Dendrocalamus asper*, *Bambusa balcooa* and *Dendrocalamus hamiltonii* may be adopted. Standardized cultivation practices at various locations may be encouraged by government and non-government organizations, especially in tribal areas in order to harmonize the international food safety, security and nutrition.

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