

## Sweet Potato as a Solubrious Food

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### Introduction:

Sweet potato (*Ipomoea batatas*) is a dicotyledonous plant belonging to the bindweed or the morning glory family, *Convolvulaceae*. It is large, starchy, sweet tasting and tuberous root vegetable. It has number of nutritional attributes that makes them an exceptionally healthy food for all age groups especially during the present pandemic.

Several species of this plant have been commonly used for religious rituals, ornamental and medicinal purposes. It is now being recognized as a salubrious food due to its nutraceutical components and abundance in carotenoids. It contains magnesium, the key mineral for de-stressing and improving the person's mood. It also promotes normal functioning of arteries, bones, muscles and nerves. Sweet potato is the 7<sup>th</sup> most produced and consumed crop worldwide after wheat, rice, maize, potato, barley and cassava and 5<sup>th</sup> in less developed countries.



### Origin:

The origin and domestication of sweet potato occurred in either Central or South America. In Central America, domesticated sweet potatoes were present at least from 5,000 years ago. Recent archaeological finding showed prehistoric remnants of sweet potato in Polynesia from around A.D. 1000 to 1100 as per radiocarbon dating. It serves as a luxury food in developed countries like USA and as nutraceutical in Japan.

### Cultivation:

Sweet potato is native of tropics requiring warm days and nights for its optimal growth and root development. It can grow in a wide variety of soils and climates. It is one of the most profitable vegetable crops with minimal farming inputs.



The crop is widely grown in tropical, subtropical and temperate areas between 40°N and 32°S. The plant cannot tolerate frost. It grows best at an average temperature of 24°C with abundant sunshine and warm nights. The annual rainfalls of 750–1000 mm is considered most suitable with a minimum of 500 mm in the growing season. Heavy rainfall, high temperature and excess cloudiness also encourage vegetative growth. Although it covers the soil quickly, weeding is necessary particularly in the early stages of crop growth.

#### **Storage :**

Sweet potatoes should be stored at 80 to 90% relative humidity, temperature of 12 – 13°C in cool, dark place with good ventilation and has to be used within 2 weeks. They should not be stored under refrigeration. It is an important supplementary crop in areas where wheat production is restricted due to climatic restraints.

#### **Physical properties:**

Sweet potato is a perennial tuber with varied flesh colours of white, cream, yellow, orange to purple whereas yellow, white and purple-fleshed tubers are most often marketed as a sweet potato while the orange-fleshed varieties are marketed as yams. The most commonly grown and eaten varieties are orange, white and cream. The true sweet potato has a shape that is often elongated and tapered at each end or somewhat oval with a rounded end. It is typically a rougher skinned vegetable that may be either long and cylindrical with a tapered end or short and round in shape. They are often sold as chunks of tuber that may be irregularly shaped rather than fully formed. Some of the common varieties of orange-fleshed sweet potatoes include Beauregard, Golden, Jewel and Red Garnet. Typically, the Beauregard is the variety most readily available in stores.

#### **Nutritive properties:**

Besides simple starches, raw sweet potatoes are rich in complex carbohydrates, dietary fibre,  $\beta$ -carotene (provitamin A carotenoid) and vitamin C with moderate contents of other micronutrients like vitamin B<sub>5</sub>, vitamin B<sub>6</sub> and manganese. The nutritional value per 100 g of sweet potato is energy 86.0 Kcal, carbohydrates 20.1 g, starch 12.7 g, protein 1.6 g, fat 0.1 g, sugars 4.2 g, dietary fibre 3.0 g and water of 77.0 g. It contains vitamin A 14187.00 IU, vitamin C 2.4 mg, iron 0.61 mg, calcium 30.0 mg and potassium 337.0 mg.

**Sweet potatoes Vs regular potatoes:**

Many people substitute regular potatoes for sweet potatoes, believing sweet potatoes to be the healthier choice. The two species contain similar amounts of water, carbohydrates, fat and protein.

Both are good sources of vitamin C and potassium, but sweet potatoes also provide excellent amounts of  $\beta$  carotene, which transforms into vitamin A in the body. The regular potatoes may be more filling but may also harbour glycoalkaloid that can be harmful to the body if consumed in large amounts. The dietary fibre and vitamin content in sweet potatoes make them a healthier choice between the two.

**Health benefits of sweet potatoes:** These are associated with multiple benefits as discussed below-

**Prevention of vitamin A deficiency:**

Dietary vitamin A deficiency is the world's most common cause of childhood blindness. A ready and cheap source of  $\beta$ -carotene is the orange-fleshed sweet potato as it contains high amounts of  $\beta$ -carotene. A regular intake of 100g per day of orange fleshed sweet potato roots provides the recommended daily amount of vitamin A for children below 10 years. Sweet potato flour proved to be the most effective way of increasing carotenoid content by about 2000% increase compared to 900–1400% for boiled and mashed sweet potato and 700–1360% for raw and grated sweet potato in different products.

The sweet potato carotenoids exist in all trans configuration which exhibits the highest provitamin A activity among the carotenoids. The increased consumption of orange-fleshed sweet potatoes as an effective approach to improve the vitamin A nutrition in developing countries.

**Improved blood sugar regulation:**

The imbalance in blood sugar levels and insulin secretion are the main characteristics of type 2 diabetes. Sweet potatoes are labelled as anti-diabetic food because they may help to stabilize blood sugar and lower insulin resistance. Caiapo, a type of sweet potato with white skin and flesh may not only decrease fasting blood glucose and LDL (bad) cholesterol levels but also increase insulin sensitivity in the body.

**Reduced oxidative damage and cancer risk:**

Oxidative damage to cells is often associated with increased risk of cancer where in cells divide uncontrollably. As sweet potato is rich in antioxidants like carotenoids, there is associated lower risk of stomach, kidney and breast cancers. Purple ones have the highest antioxidant activity. These are widely considered safe but may increase the risk of kidney stone formation due to their oxalate content.

**Boosting immunity:**

One serving (124.0 g) of sweet potato provides 12.8 mg of vitamin C. A person consuming little or no vitamin C can develop scurvy. Regular consumption helps in reducing occurrence of scurvy and provides immunity. Similarly, one serving provides 259.0 mg of potassium or around 5.0% of the daily requirements for an adult.

Sweet potato flour being rich in dietary fibre lowers the risk of constipation, diverticulosis, colon and rectal cancers. Sweet potato dietary fibre is high in both soluble and insoluble fibres. The soluble dietary fibres increase the viscosity of food in the intestines and thereby slow down glucose and sterol absorption. The insoluble fibres reduce the intestinal transit time and increase the faecal bulk due to their high-water holding capacity.

**Nutritional quality of sweet potato:**

The high nutritional value of sweet potato resulted in them being selected as one of the foods for long term space travel. Although it is a high nutritive food, it is still an untapped food due to lack of scientific research on its value-added products. Sweet potato is a great source of carbohydrates,  $\beta$ -carotene and fibre. It is considered to be staple or co-staple food in many Asian and African countries. The high levels of starch in it provides good source of energy for human consumption.

**Culinary uses of sweet potatoes:**

Their leaves are edible and can be prepared used in different cuisine like any other greens. It goes well with meat, poultry, fish and seafood also. They can also be added to casseroles, soups and stews to enhance the flavours of other ingredients and as a thickener. It is served as an ingredient in salads, pies, cookies, cakes, puddings and custards.



**Sweet potato parathas****Sweet potato millet rice****Baked sweet potato fries****Roasted sweet potato fries**

**Conclusion:** Sweet potato is considered as a super food, when compared to other vegetables due to its versatile and delicious taste and high nutritional value. Nowadays, sweet potato is preferred over other vegetables due to its multifaceted medicinal properties. The medicinal properties of sweet potato include anti-cancer, antidiabetic, anti-inflammatory, antioxidant, antibacterial, antifungal, antiviral, antiulcer, hepatoprotective, wound healing and immunomodulatory activities. It can alleviate muscle cramps due to their high potassium content and magnesium in it is a crucial mineral that promotes relaxation, calmness, mood and nerve health.