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Sweet potato– Wholesome nutrition in a SPUD

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ABSTRACT

Sweet potatoes deliver life-saving nutrition. Sweet potatoes are true to their name. They are sweet , no matter what colour they are – purple, orange, white or yellow. While the sweet potato comes in many colors, the orange ones are the most packed with vitamin A. This is particularly important in Sub-Saharan Africa, where more than 43 million children are vitamin-A deficient. Orange-fleshed sweet potato could help them avoid blindness, disease and even death! Sweet potatoes are full of the A, B, C's – and E's. They're a valuable source of all these vitamins and even contain some iron and zinc. Just one ice-cream scoop's worth of orange-fleshed sweet potato (150 g) meets a child's full daily need for vitamin A. Sweet potatoes are versatile. From Latin America to Africa and Asia to the White House garden, as long as the climate is hot and moist, sweet potatoes will thrive. They can grow anywhere from sea level up to 2,500 meters. They can also be incorporated into many recipes. In Africa, you can find bread, juices and other snacks made from sweet potatoes. You can even substitute sweet potatoes for a portion of wheat flour when baking to increase nutritional content.

Key Words : Beta-carotene, Anthocyanin, Phytonutrients, Orange-fleshed sweet potato

INTRODUCTION

Sweet potato (*Ipomoea batatas*) is in the botanical family Convolvulaceae along with common plants, such as bindweed and morning glory. The generic name Ipomoea comes from the Greek words "ips," which means bindweed, and "homoios," meaning similar. Sweet potatoes should not be confused with ordinary potatoes (*Solanum tuberosum*) as they are entirely unrelated, although their uses can be similar. Orange-fleshed sweet potatoes are often known as yams, especially in the southern United States, but they are quite different from true yams (*Dioscorea* sp.) in growth habit and use. Furthermore, unlike true yams, the greens of sweet potatoes are edible and provide an important source of food in Africa and Asia.

Origin :

The cultivation of sweet potatoes dates back to 750 BC, making it one of the oldest foods known to man. After Christopher Columbus' introduction of yams to Europe, the Spanish and Portuguese explorers brought sweet potatoes to different parts of the world, including Asia and Africa. In the 16th century, the United States – particularly in the southeastern part – consumed sweet potatoes as a staple food.

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About 400 varieties of sweet potatoes have been discovered, with some rarer than others. They are set apart using the appearance of their skin and color, including cream, tan, yellow, orange, pink, and purple. While they are in season during the months of November and December, they are available all-year round in local markets.

Nutritional profile :

The orange-flesh sweet potatoes are exceedingly rich in beta-carotene. The purple-flesh varieties are outstanding sources of anthocyanins, especially peonidins and cyanidins. Both types of sweet potatoes are rich in unique phytonutrients, including polysaccharide-related molecules called batatins and batatosides. Sweet potatoes also include storage proteins called sporamins that have unique antioxidant properties. Sweet potatoes are an excellent source of vitamin A (in the form of beta-carotene). They are also a very good source of vitamin C, manganese, copper, pantothenic acid and vitamin B6. Additionally, they are a good source of potassium, dietary fiber, niacin, vitamin B1, vitamin B2 and phosphorus (Table 1).

Table 1 : Constituents of the sweet potato: values per 100g (3.5 oz.) edible portion

	Units	Raw sweet potato	Cooked, baked in skin	Cooked, boiled without skin
Water	g	72.84	72.84	72.84
Energy	kcal	105	103	105
	kj	439	431	439
Protein	g	1.65	1.72	1.65
Total lipid (fat)	g	0.30	0.11	0.30
Carbohydrate by difference	g	24.28	24.27	24.28
Fiber, total dietary	g	3.0	3.0	1.8
Ash	g	0.95	1.06	0.95
Calcium Ca	mg	22	28	21
Iron Fe	mg	0.59	0.45	0.56
Magnesium Mg	mg	10	20	10
Phosphorous P	mg	28	55	27
Potassium K	mg	204	348	184
Sodium Na	mg	13	10	13
Zinc Zn	mg	0.28	0.29	0.27
Copper Cu	mg	0.169	0.208	0.161
Manganese Mn	mg	0.355	0.560	0.337
Selenium Se	mcg	0.6	0.7	0.7
Vitamin C	mg	22.7	24.6	17.1
Thiamin B_1	mg	0.066	0.073	0.053
Riboflavin B_2	mg	0.147	0.127	0.14
Niacin B_3	mg	0.674	0.604	0.64
Pantothenic acid B_5	mg	0.591	0.646	0.532
Vitamin B_6	mg	0.257	0.241	0.244
Folate, total	mcg	14	23	11
Vitamin B_{12}	mcg	0	0	0
Vitamin A, IU	IU	20,063	21,822	17,054
Vitamin A, RE	mcg-RE	2,006	2,182	1,705
Vitamin E	mg-ATE	0.280	0.280	0.280

Source: U.S. Department of Agriculture. Agriculture Research Service Nutrient Database for Standard Reference, Release 14, 2001

Sweet potatoes crop plant has a long history of saving lives. It matures fast, is rich in nutrients, and is often the first crop planted after a natural disaster, providing abundant food for otherwise starving populations. In eastern Africa the sweet potato is known as "the protector of children" or cileraabana because it is often the only food that stands between a child's survival and starvation.

Sweet potatoes aren't just for humans – they make great food for animals too. Farmers feeding sweet potato vines to their chickens report that they produce more and better quality eggs. And studies show dairy cows fed with high-protein sweet potato vines produce less methane gas than when fed other feed, potentially helping reduce harmful global emissions. Sweet potatoes also require less water to grow than most grains. So basically, sweet potatoes are climate-smart too!

Sweet potato roots can be boiled, steamed, baked, and fried. They are also canned or dried and made into flour, cereal, and noodles. Like pumpkins, sweet potato roots are often used in sweet dishes, such as pies, puddings, biscuits, cakes, and desserts. In some countries roots are processed to produce starch and fermented to make alcohol. Cooked red- orange-fleshed sweet potato roots are sweet, soft, and starchy with a flavor that resembles roasted chestnuts and baked squash. Cooking in the skin preserves more of the nutrients.

Beneficial compounds found in sweet potatoes :

When consumed in moderation, sweet potatoes can provide a rich concentration of nutrients. This makes them an ideal addition to your meals throughout the year.

A substantial amount of research has proven that these naturally-sweet root vegetables possess antioxidant, anti-inflammatory, and disease-fighting components.

Orange-colored sweet potatoes owe their appearance to the carotenoid beta-carotene. Carotenoids are natural pigments responsible for the colorful appearances of some fruits and vegetables.

As an antioxidant, beta-carotene can help ward off free radicals that damage cells through oxidation, which can speed up aging and make you vulnerable against chronic diseases. This antioxidant can help support your immune system, as well as lower your risk of heart disease and cancer.

Beta-carotene can be converted into retinol or vitamin A by your body, and vitamin A contributes to optimal eye health and vision. While taking vitamin A in large doses can be toxic, receiving it from beta-carotene is considered safe due to your body's ability to regulate its vitamin A production.

Sweet potatoes can also contribute to skin health. Vitamin A, which is a natural anti-inflammatory, can help get rid of acne-causing bacteria.

Purple sweet potatoes, on the other hand, contain anthocyanins, another type of natural pigments. Anthocyanins are associated with reduced cancer risk. Studies show they help suppress stomach, colon, lung, and breast cancer cell proliferation. They also prevent blood clots by stopping platelets from clumping together – a function that may help fight heart disease.

While orange sweet potatoes have anti-carcinogenic properties, it was found that purple sweet potatoes have better cancer-fighting abilities because they have cyanidins and peonidins, which have a positive effect against cancer cell growth.

These cancer-fighting compounds, which are more prevalent in the flesh than in the skin, are found to help reduce the potential dangers of heavy metals, such as mercury, cadmium, and arsenic. This is beneficial to individuals diagnosed with digestive problems like irritable bowel syndrome and ulcerative colitis, as well as to those who wish to reduce their exposure to metal toxins.

Sweet potatoes also contain two important antioxidant enzymes: copper/zinc superoxide

dismutase and catalase. According to one study, purple sweet potatoes have more than three times the antioxidant activity than that of one blueberry. In addition to sweet potatoes' antioxidant content, these vegetables are also great sources of vitamins C and B5, copper, dietary fiber, niacin, potassium, and iron.

As a medicine :

Sweet potato roots and leaves are used in folk remedies to treat illnesses as diverse as asthma, night blindness, and diarrhea. Easily digestible, they are good for the eliminative system. It is believed they bind heavy metals, so they have been used to detoxify the system.

As a pest controller :

Sweet potatoes sweeten fields too! Because they come from a different genus than many other crops, farmers may plant them in between planting other crops to prevent pest build up. George Washington Carver developed this technique, called crop rotation.

Sweet potatoes can address inflammation, too :

Choline, present in sweet potatoes, is a very important and versatile nutrient; it helps with sleep, muscle movement, learning, and memory. Choline also helps to maintain the structure of cellular membranes, aids in the transmission of nerve impulses, assists in the absorption of fat, and reduces chronic inflammation.

In a study published in the Journal of Medicinal Food, purple sweet potato extract was found to have anti-inflammatory effects as well as mopping up free radicals. Sweet potato extract is said to help reduce inflammation in brain and nerve tissue throughout your body. The phytonutrients within sweet potatoes also influence fibrinogen, an important glycoprotein required for blood clotting. Together with thrombin and fibrin, balanced amounts of fibrinogen are important for wound healing and blood loss prevention.

For women of childbearing age, consuming more iron from plant sources appears to promote fertility, according to Harvard Medical School's Harvard Health Publications. The vitamin A in sweet potatoes (consumed as beta-carotene then converted to vitamin A in the body) is also essential for hormone synthesis during pregnancy and lactation.

Sweet potatoes safe for diabetics and pre-diabetics :

According to research conducted in the College of Agriculture and Life Sciences, sweet potatoes are a low-glycemic index (GI) food, which release glucose very slowly into the bloodstream. Low-glycemic foods also benefit the pancreas by not overworking it and make you feel satiated longer.

Other research shows that sweet potatoes can help regulate blood sugar because of their ability to raise blood levels of adiponectin, a protein hormone created by your fat cells, to help regulate how your body metabolizes insulin.

Sweet potatoes in Africa :

In eastern and southern Africa some 3 million children under the age of five suffer from exophthalmia or dry eye, which causes blindness. Dry eye is caused by a lack of vitamin A in the diet, and many of the affected children die within a few months of becoming blind. The yellow-and orange-fleshed varieties of sweet potatoes are high in beta-carotene, which can be converted into

vitamin A in the intestines and liver. It has been shown that even small amounts of these sweet potatoes as a regular part of the diet will eliminate vitamin A deficiency in adults and children. African countries have traditionally grown white-fleshed sweet potatoes, which are low in vitamin A. A ten-year research project concluded that varieties high in beta-carotene could compete with production levels of the white-fleshed varieties and would be acceptable to local tastes. Consequently CIP and related organizations launched a regional effort to encourage African women to also grow orange-fleshed varieties.

Bio availability of nutrients :

The method of cooking or preparation is as important as the food you eat, as this can greatly impact the quality of your meals. Sweet potatoes are no exception.

Steaming or baking them will improve the bioavailability of beta-carotene, making the antioxidant more accessible to your body. Although many boil sweet potatoes, I do not recommend it, for it can destroy the beneficial compounds.

Peeling can make the sweet potato's flesh susceptible to oxidation, which can induce dark spots. It is recommended that sweet potatoes be steamed, baked, or placed in water immediately after peeling.

Since beta-carotene is fat-soluble, consuming sweet potatoes with fat – about three to five grams of fat is sufficient. Fat-soluble nutrients require fat to be absorbed effectively in your body.

In one medium spud, there is over 400 per cent of your daily vitamin A requirement, plus loads of fiber and potassium. They have more grams of natural sugars than regular potato but more overall nutrients with fewer calories.

Sweet potatoes are a great source of beta-carotene, a powerful antioxidant that gives orange fruits and vegetables their vibrant color; beta-carotene is converted to vitamin A in the body. Consuming foods rich in beta-carotene may reduce the risk of developing certain types of cancer, offer protection against asthma and heart disease, and delay aging and body degeneration. Keeping the skin on sweet potatoes contributes significant amounts of fiber, potassium, and quercetin.

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