

Sweetpotato Greens: Nutritious partners deserving greater attention

Sweetpotato leaves are a well-accepted, nutritious green vegetable in a number of countries around the world, but are underutilized and have limited or no economic value in many places where sweetpotato is grown. Though the beta-carotene in leafy greens is not as bio-available as that found in orange-fleshed sweetpotato (OFSP) roots, sweetpotato greens do have significant quantities of beta-carotene and lutein, in addition to minerals, vitamins, phytochemicals, fatty acids and dietary fiber that are required for a healthy diet. Promoting commercialization and consumption of sweetpotato leafy greens complements efforts to promote OFSP roots and foster household food and nutrition diversification under the Sweetpotato for Profit and Health Initiative (SPHI).

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Fig. 1 Sweetpotato multiplication field in Bawku, Ghana. Such gardens can serve for leafy green as well as vine production (credit E. Abidin)



Why sweetpotato leaf?

Sweetpotato is not only a nutritious and high yielding crop for its storage roots, but its tops are also very productive and nutritious. In the field, sweetpotato vines can grow quickly to cover the ground and help to protect the soil, conserve moisture, and prevent erosion. The vines are a nutritious animal feed, and can be preserved as silage or hay.

The tender vine tips can be used as greens and easily adapted to local cuisines and taste preferences. Thus, they have potential to contribute to healthy diets and income generation. In healthy humans, the conversion ratio of beta-carotene to retinol (vitamin A) is roughly 12-13:1 for OFSP roots, while the value for leaves has not yet been determined, but is likely to range from 15-24:1 similar to other dark green leaves. For both roots and leaves, absorption of beta-carotene is enhanced greatly if the sweetpotato is cooked with a small amount of oil.

However, the leaves are an outstanding source of lutein (essential for eyesight) and a good source of

other healthy constituents (Table 1), including a host of polyphenolics (including anthocyanins, flavonoids and caffeic acid derivatives) minerals, protein, omega-3 fatty acids and dietary fiber. Anthocyanins and polyphenolics have biologically active compounds that are anti-oxidants and can help fight inflammation and cancers. In places such as China, sweetpotato greens are a high value, sought after healthy vegetable, and demand for them is spurred by studies indicating that they can help to combat chronic non-communicable diseases such as cardiovascular disease, diabetes, hypertension and some cancers.

In the context of sub-Saharan Africa (SSA), sweetpotato greens are a traditional vegetable in many places, but their nutritional value and health benefits are not yet widely appreciated. These greens are contributing to the objectives of the SPHI - at the household level, where they are contributing to diversified diets, and at the market level, where consumer demand is stimulating production and enterprise development. Sweetpotato leaves are far superior in nutritional value to cabbage, and align well with traditional dark green leaves grown in SSA (Table 1). In a few countries, like Kenya and Uganda, vines and leaves are considered to be animal feed, not human food. In such cases, additional effort is needed to convince households that greens should be eaten regularly by people.



Table 1. Nutrient Composition per 100 grams¹ of African Indigenous Vegetables, Cabbage and Orange-fleshed Sweetpotatoes (OFSP) Roots and Leaves

Nutrient	Ama-ranthus	Spider Plant	Black Nightshade	Cowpea Leaves	Cabbage	OFSP Roots	OFSP Leaves
Energy (kcal)	42	34	38	22	22	80-110	34
Protein (gms)	4.6	4.8	4.3	4.7	1.0	1.4	2.3
Fiber (gms)	1.8	N.A.	1.3	N.A.	1.9	2.5	1.9
Beta-carotene (µg)	5,716	N.A.	3,660	348	74	3,595-13,184	550
Vitamin A ² (µg RAE)	477	N.A.	306	29	7	300-1,100	46
Vitamin C (mg)	64	13	20	18	20	13	1.5
Vitamin B1: Thiamine (mg)	0.05	N.A.	N.A.	0.26	0.06	0.06	0.11
Vitamin B2: Riboflavin (mg)	0.42	N.A.	N.A.	0.14	0.06	0.05	0.27
Niacin (mg)	0.56	N.A.	N.A.	1.01	0.28	0.54	1.00
Vitamin B6 (mg)	0.18	N.A.	N.A.	0.14	0.11	0.16	0.16
Iron (mg)	8.9	6.0	1.0	1.1	0.17	0.7	0.6
Calcium (mg)	410	288	442	69	31	27	24
Phosphorus (mg)	103	111	75	42	15	32	60
Lutein + zeaxanthin (g)	N.A.	N.A.	N.A.	N.A.	253	0	2,633

¹ Sources: For Amaranthus, Spider Plant and Black Nightshade: FAO nutrient database, raw values. For Cowpea Leaves, cabbage, OFSP Roots and Leaves: cooked values from U.S. Department of Agriculture (USDA), Agricultural Research Service. USDA National Nutrient Database for Standard Reference, Release 16, except for the beta-carotene and RAE values for which the range for varieties used in Kenya are shown.

² RAE means Retinol Activity Equivalent. Conversion rate of 12 units beta-carotene for 1 unit retinol used. Foods that have at least 100 µg RAE per 100 gms are good sources of Vitamin A.

How are we promoting the sweetpotato leaf?

Our efforts to promote OFSP at the household level routinely include behavior change communication, information provision on utilization to engage consumers from all socio-economic levels, and cooking demonstrations (which include OFSP roots and sweetpotato leaves). When encouraged, cooks quickly adapt sweetpotato greens to local dishes, which provides them with the sense of ownership needed for adoption. Extension and health services and NGOs can readily incorporate such activities into their work programs. Training on processing and utilization, sensitization on the nutritional value of sweetpotato leaves, as well as OFSP for health and income generation are key elements for success in promoting demand and consumption of sweetpotato greens. Recent examples of such successful efforts come from Malawi and Ghana.

What is the best way to produce sweetpotato greens?

Efforts to promote sweetpotato focus on planting material and root production. Good sweetpotato vine multipliers with access to water can develop leafy green production as a market opportunity during the dry season (Fig. 1), but should avoid use of harmful pesticides. It is also possible to produce both greens and roots without significant negative effect on root yield, but this needs to be carefully managed, with limited harvest of greens commencing only 90 days after planting. This is true in commercial plantations and home gardens.

Some dishes and products with sweetpotato greens (details in references)



Fig. 2 Sweetpotato leaves in peanut sauce. A popular dish in Asia, introduced to Malawi (credit E. Abidin)

Fig. 3 Sweetpotato leaves fried with onion, tomato, chili and small fish. A popular dish in Asia, and introduced to Malawi (credit E. Abidin)

Fig. 4 Sweetpotato leaf stew with egusi (melon seeds): a West African dish adapted in Ghana (credit E. Abidin)

Fig. 5 Sweetpotato greens and roots in a one-pot multi-mix meal promoted in Malawi by the Scaling up Nutrition movement (without meat (a) and with meat (b) (credit E. Abidin)

Fig. 6 Sweetpotato leaf soup with okra. Adapted in Ghana (credit E. Dery)

Fig. 7 Sweetpotato leaf stew or Palaver sauce. Adapted in Ghana (credit E. Dery)

Fig. 8 Sweetpotato leaf juice, blended with pineapple or orange juice. Developed in Malawi (credit E. Abidin)

Fig. 9 Sweetpotato leaf soup with smoke fish and any other meat Adapted in Ghana (credit E. Dery)

References

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