

PUMPKIN & CHOKO

Botanical name: Pumpkin *Cucurbita spp.* (Cucurbitaceae)

Choko *Sechium edule* (Cucurbitaceae)

Location specific common names for pumpkin: te baukin (Kiribati), panikeni (Tuvalu), squash, gramma (the types used to make soup, e.g. trombone, spherical, butternut)

Location specific common names for choko: chayote, vegetable pear, cho-cho, pipinola, christophine

Plant Characteristics: There are numerous pumpkin types. The true pumpkin, *Cucurbita moschata*, is best for most tropical conditions and provides tender and sweet tips. Under favourable conditions pumpkin and choko are fast growing vine-like plants that spread along the ground and are able to climb. Choko vines need trellis support.

Uses: In addition to eating the fruit, tender growing tips of pumpkin and choko can be used fresh in salads or lightly steamed. Older leaves are best cooked by steaming, boiling, frying or baking. **Medicinal:** *Cucurbita* leaves and choko fruit have been used traditionally, especially in West Africa, to combat anaemia, fever, pathogenic bacteria and eye disorders. They have demonstrated anti-inflammatory, anti-diabetes, anti-hypertensive (can reduce high blood pressure) and anti-dyslipidaemic (can reduce harmful blood fats) effects.

Availability: The gramma types are often grown year round and are common in Kiribati and Tuvalu. Once established, choko vines can produce all year if well watered and growing vigorously.

Propagation methods: Pumpkin plants can be grown from seed which has been purchased as packaged seed, self-saved or taken from shop fruit. Choko is grown from sprouted fruit planted in the soil with the sprout above the surface. The sprouted fruit should be protected from sun and weeds.

How to grow: Pumpkins and choko are not difficult to grow providing the soil is rich in organic matter and water is readily available. They grow satisfactorily in Kiribati and Tuvalu on well composted, well watered soil. They can be grown all year in most tropical locations, including those with full sun. Soils of poorer fertility and insufficient water will produce plants with thinner stems, smaller, slower-growing leaves with a stronger, bitter flavor. The area around the plants should be kept moist and free of grass and other weeds.



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Threats: Some pests and diseases can be limiting factors for pumpkins and chokos. Fungal leaf diseases like downy and powdery mildew along with root nematodes can limit plant growth. Providing good growing conditions, wide plant spacing and crop rotation can reduce the occurrence and extent of these problems.

Harvesting: Under good growing conditions, harvesting can be carried out daily. Tips and older leaves can be picked or cut with a sharp knife or snips. Harvesting should be done in the cooler hours of the day to prevent wilting. Where a tip has been harvested, that runner should produce one or more new tips suitable for picking in a week.

Post harvest and storage: Leaves/tips should be washed carefully with water of drinking quality or clean seawater. They can be loosely bundled with their stems trimmed and stood upright in a small amount of clean fresh water, and if covered with a clean plastic bag, and kept cool, they should store for a day. If placed in an airtight container in a cool room or refrigerator, they can last two or three days.

Project findings/nutritional value: Samples of pumpkin and choko tips were collected for analysis from Kiribati, northern Queensland, Torres Strait Islands, Samoa, Tonga and Solomon Islands. Two to three handfuls of fresh vegetable per person for a meal serving will provide useful nutrition. Pumpkin and choko tips were notable nutritional all-rounders, being consistently high in protein, potassium, phosphorus, iron, zinc and copper. Carotenoid levels in pumpkin leaf samples from Cairns, Upolu (Samoa) and Thursday Island (Torres Strait Islands, Queensland, Australia) averaged 291, 5 and 105 mg/kg for lutein, α -carotene and β -carotene, respectively. These are moderate/medium levels for leafy vegetables.

Protein: This is important in forming muscle, cell membranes, enzymes, blood components (including haemoglobin, albumin, transferrin), antibodies, DNA and RNA. The nitrogen analyses of our samples indicated a crude protein range of 18-30%. Some samples had more protein than many legumes.

Potassium: Controls body water balance through its interactions with sodium and chloride ions, and is involved in electrical stimulation of nerves and muscles. Deficiency can cause muscle weakness, cramps and irregular heartbeat.

Phosphorus: Component of genetic material (DNA and RNA) and various fats and proteins; important role in energy production.

Iron: Important for healthy blood and energy.

Zinc: Important for immunity, growth, carbohydrate metabolism, and DNA and protein formation. Humans have around 600 different Zn-containing enzymes/proteins.

Copper: Component of enzymes, involved in iron metabolism, therefore supports production of healthy blood and generation of energy.

This table compares selected mineral nutrients in young leaves of pumpkin with leaves of *chaya* and *Ipomoea pes-caprae* (te ruku or beach morning glory, a sweet potato relative) growing at Paris, Beru atoll, Kiribati in 2017, and English cabbage (average of samples bought from Honiara market, Solomon Islands and Nukualofa market, Tonga in 2012) (concentration in mg/kg dry weight, except N: % dry weight).

	Fe	Cu	Zn	Ca	Mg	K	P	S	N%
Pumpkin	88	19	107	12800	6800	34900	8100	3200	4.7
Chaya	77	8	79	33300	11100	9900	2900	3600	4.2
Te ruku	38	14	52	14400	4900	37000	3300	3100	3.2
Cabbage	40	2	20	5700	1450	29000	3750	3750	2.8

Fe: iron; Cu: copper; Zn: zinc; Ca: calcium; Mg: magnesium; K: potassium; P: phosphorus; S: sulphur; N: nitrogen
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