Rotary | FOOD PLANT SOLUTIONS ROTARY ACTION GROUP
Solutions to Malnutrition and Food Security

Food Plant Solutions Brief Guide to Food Plants in the Gold Coast region

Our bodies need nutrients to be healthy and strong - nutritious food provides these:

Starch: Starch provides sustained energy for the body.

Protein: Protein helps the body repair cells and make new ones. Protein is also important for growth and development in children, teens, and pregnant women. Symptoms of protein deficiency include wasting and shrinkage of muscle tissue, and slow growth (in children).

Vitamin A: Vitamin A is very important for eyesight and fighting disease, particularly in infants, young children and pregnant women. People who are short of Vitamin A have trouble seeing at night.

Vitamin C: Vitamin C helps us avoid sickness, heal wounds, prevent infections and absorb iron from food. Severe vitamin C deficiency increases the risk of scurvy with symptoms such as inflammation of the gums, scaly skin, nosebleed and painful joints.

Iron: Iron is important because it helps red blood cells carry oxygen from the lungs to the rest of the body. Low levels of iron cause anaemia, which makes us feel fatigued. Iron is also important to maintain healthy cells, skin, hair and nails. Iron is more available when Vitamin C is also present.

Zinc: Zinc is particularly important for the health of young children and teenagers, and to help recovery from illness. It is needed for the body's immune system to work properly. It plays a role in cell division, cell growth, wound healing, and the breakdown of carbohydrates. Zinc is also needed for the senses of smell and taste. Zinc deficiency is characterized by stunted growth, loss of appetite, and impaired immune function.

Starting a garden

PLAN:
Identify a suitable location for the garden. Factors to consider include:
A site that receives 6-8 hours a day of sunlight and is not shaded by buildings or trees.
Easy access – a garden that is difficult to get to will not be maintained.
Protection from predators like native animals. If this is an issue, consider what can be used as a barrier and install it before planting.
Adequate and easily accessed water, whether it be a garden hose or a watering can.

TOOLS AND EQUIPMENT:
What do you need to turn over the soil, to plant seeds and seedlings (e.g. spade, hand trowel, hoe) and how will soil be moved to cover seeds (e.g. rake). Can you borrow tools to reduce your start-up costs?

SIZE:
Gardens can be all different sizes. Plan the size of your garden – what space is available and how much time do you have? Start small and increase the area as you become more confident. If space is limited, remember plants can be successfully grown in containers or pots.

BUILD:
Clear the area, removing any existing plants and large weeds (turn the soil – dig, lift and turn it over onto itself). Once the soil has been loosened, spread compost and work it into the soil. Avoid stepping on freshly turned soil, as this will compact the soil and undo your hard work. Once the digging is complete, smooth the surface with a rake and water thoroughly. Allow the bed to rest for several days before planting. Use a good quality potting medium if using pots and containers.

PLANT:
Seeds and seedlings can be purchased from nurseries, garden centres and most hardware stores. A packet of seeds will grow a lot of seedlings but take longer to mature than transplanted seedlings. Plant seeds and seedlings in accordance with their specific directions and apply sufficient water to ensure the soil around the seeds and/or seedling roots is moist. Consider how tall and wide each plant will grow when planning the space between plants. Information on seed packets or seedling labels will indicate the appropriate distance between neighbouring plants. Add a thick layer of mulch around seedlings to help keep the soil moist. Make small signs to stick in the ground to show what you have planted.

MAINTAIN:
Plants need regular watering, which ideally should occur in the morning, never in the heat of the day. Weeds will compete with the plants for nutrients and water, so it is important to keep them to a minimum. Hand weeding and adding mulch around seedlings will help keep weeds under control.

Starchy Staples provide energy and dietary fibre

Common name: Sweet potato

Scientific name: *Ipomoea batatas*

Cultivation: Vine cuttings are used for planting. In grassland soils it is grown in mounds, ridges, or other raised beds. In bush fallow, it is mostly planted in undug loose soils. It needs a sunny position. Tubers will not form if the ground is waterlogged when tubers start to develop. Sweet potato are not tolerant to shading.

Use: Tubers are boiled or baked. They can be steamed, fried, mashed, or dried. They can be used in noodles. The chopped and dried tubers can be boiled with rice or ground into flour and mixed with wheat flour to make cakes or bread. The young leaves are edible.

Nutrients: energy, vit A

Common name: Potato

Scientific name: *Solanum tuberosum*

Cultivation: Plants are grown from tubers. Large tubers can be cut to include a bud or "eye". A seed piece of 40-50 g is suitable. It is best to inter-crop as this stops bacterial wilt spreading. The plant is surrounded by dirt when 20-25 cm tall. Later the tubers need to be kept covered with dirt.

Use: The tubers are cooked and eaten. They are also fried, canned, and made into starch. The tubers are boiled, baked, roasted, mashed, and used in soups, stews, dumplings, pancakes and potato salads.

Nutrients: energy, iron, zinc

Common name: Sweetcorn

Scientific name: *Zea mays*

Cultivation: It is grown from seeds. It is normal to plant one seed per hole at 1-2 cm depth. A spacing of about 30 cm between plants is suitable.

Use: The cobs are eaten cooked. The dried grains can be crushed and used. The meal can be used for breads, cake, soups, stews etc. Maize is cooked and prepared in many ways such as boiled, roasted, dried and steamed.

Nutrients: energy, protein, vit A, iron

Legumes provide protein for growth

Common name: Lima bean

Scientific name: *Phaseolus lunatus*

Cultivation: Coloured seeds are often hard to get to grow but white seeded kinds grow easily. Sow 3-4 seeds in a hill and put a stick 2-3 m tall in the middle. Hills should be about 1 m apart. Seeds should be 2-4 cm deep.

Use: The leaves, young pods and seeds are all eaten. The seeds are eaten fresh or after drying and are fried in oil. Dried beans are boiled or baked and can be used in soups and stews. The seeds are sometimes grown as bean sprouts then cooked and eaten. **Caution:** Some kinds have poison (hydrocyanic acid) which is destroyed by thorough cooking. The beans contain a protein inhibitor that is destroyed by cooking.

Nutrients: seed (cooked): energy, protein, iron, zinc

Common name: Common bean

Scientific name: *Phaseolus vulgaris*

Cultivation: Plants are grown from seed, preferably sown in raised beds. Seeds remain viable for 2 years. Germination is good if seed has been stored well. Climbing types need stakes. Plants are self-fertilised. Beans can be intercropped with other plants. If grown on their own, bush types can be spaced at 25 cm x 25 cm. They can be sown closer together in rows wider apart to make weeding and harvesting easier. For dried beans, once pods are mature and turning yellow, the whole plants are pulled, then dried and threshed. Flowering in most varieties is not affected by day length.

Use: The young pods, leaves and mature seeds are edible. Dry seeds are soaked in water and boiled until soft.

Nutrients: protein, vit A

Common name: Peanut

Scientific name: *Arachis hypogea*

Cultivation: Peanuts require soil with good levels of calcium or they produce empty pods. If boron is limited, flowers won't fruit properly. Peanuts have root nodule bacteria which fix nitrogen. The seeds or nuts are removed from the shell before sowing 2 - 3 cm deep. Virginia-type peanuts have a dormancy period so must be stored before replanting. A suitable spacing is 10 cm between plants and 60 - 80 cm between rows. Plants are often grown in mixed cultures. The soil needs to be weeded and loose by flowering to allow the seed pod pegs to penetrate the soil. When the whole plant dies, they are ready to pull and dry in the sun for 3 - 4 days.

Use: Seeds can be eaten raw or boiled, steamed, roasted, salted or made into peanut butter or flour for bread. Young leaves are edible when cooked. Unripe pods are cooked and eaten. Sprouted seeds are eaten. An edible oil is extracted from the seeds. The remaining meal is also eaten.

Nutrients: seed: energy, protein, iron, zinc

Leafy greens are a source of iron

Common name: Amaranth greens

Scientific name: *Amaranthus hybridus*

Cultivation: Plants are grown from seeds. Do not grow in soil enriched with lots of compost.

Use: The leaves and young shoots are cooked and eaten. They are also dried. The leaves and stems are chopped and added to salads or fried with eggs.

Nutrients: leaf: protein, vit C, iron

Common name: Indian spinach

Scientific name: *Basella alba*

Cultivation: It can be sown from seeds or cuttings. A spacing of 1 m is suitable. Plants grown from seed are more productive than from cuttings. When cuttings are used, 20-25 cm long cuttings are suitable. Partial shade, rich fertile soil, and adequate moisture favour abundant leaf production. It is responsive to nitrogen fertiliser. Light shade gives bigger leaves. It requires a trellis to climb over. Frequently picking off the bud encourages branching.

Use: The leaves can be eaten raw in salads or cooked like a vegetable. They are also dried and stored. When fresh they can be stored for 4-5 days. The young shoots and leaves are eaten cooked. They are somewhat slimy. In soups and stews the mucilage can be used as thickening. The purple colour of fruit is harmless and is used to colour vegetables and agar-agar. Some lemon juice added to the dye enhances the colour.

Nutrients: energy, protein, vit A, vit C, iron, zinc

Common name: Kale

Scientific name: *Brassica oleracea* var. *acephala*

Cultivation: Plants are grown from seed. Seedlings can be transplanted 30 cm apart.

Use: The leaves are eaten boiled, steamed and used in soups and stews. The unopened flower buds are used like broccoli.

Nutrients: vit C, iron

Fruit are an important source of vitamins and dietary fibre

Common name: Pawpaw

Scientific name: *Carica papaya*

Cultivation: Pawpaw seeds grow easily, and plants grow quickly. Fresh seeds can be used, or if dry seeds are used, they should be soaked before planting. Seeds should be planted when temperatures are 24-30°C. Seedlings can be transplanted when they are about 20 cm high. Plants should be about 3 m apart.

Use: Fruit can be eaten ripe and raw. Green fruit can be cooked as a vegetable. The young leaves can be eaten cooked but are bitter. The flowers and the middle of the stem can be eaten.

Nutrients: vit A, zinc

Common name: Dragon fruit

Scientific name: *Hylocereus undatus*

Cultivation: Plants can be grown by seed or stem cuttings. The cuttings are usually dried out for a week or two. The plants are self-sterile and have to be pollinated by bats and moths. Hand pollination is recommended for good fruit production.

Use: The fruit is eaten fresh. It is also used for drinks. A syrup of the fruit is used to colour pastries and candy.
The unopened flower buds are cooked and eaten as a vegetable. They are used in soups.

Nutrients: fruit: vit C, iron.

Common name: Passionfruit

Scientific name: *Passiflora edulis*

Cultivation: Plants are grown by seeds or cuttings. Seeds germinate in 15-45 days. Seedlings can be grafted. Plants are put in a hole 30 cm deep and which has had organic matter added. A spacing of 3-4 m apart is suitable. Plants need a trellis to climb over.

Use: The fleshy portion of the fruit is eaten raw. Passionfruit are also used for flavouring in juices, and with other foods. It is used in sherberts, custards, cakes, sauces, pies, fruit soups, candies and ice cream. The seeds are edible. They also yield an edible oil. The tender shoots are boiled and eaten. They are added to meat curry.

Nutrients: vit A, zinc

Vegetables are an important source of vitamins and dietary fibre

Common name: Okra

Scientificname: *Abelmoschus esculentus*

Cultivation: They are grown from seeds. Seeds are easy to collect. They need high temperatures for germination (over 20°C) and a sunny position. Often seeds are soaked for 24 hours before sowing to give quick germination. Seeds are sown 1.5-2.5 cm deep with 2-3 seeds per hole. Later these are thinned out to one plant. Seeds can be sown in nurseries and plants transplanted. Pinching out the tops of plants when 30 cm high encourages branching. A spacing of about 90 x 45 cm is suitable.

Use: Pods are eaten cooked. They are slimy, but less so if fried. They are also less sticky if a little lemon is added. Dried powdered seeds can be used in soups. It thickens the soup. They can also be pickled. Young leaves can be eaten cooked. They can be dried and stored. Flowers can also be eaten. Okra can be frozen and canned.
Nutrients: seed: energy, protein; pod: vit A, vit C; leaf: vit A, vit C

Common name: Beetroot

Scientific name: *Beta vulgaris*

Cultivation: Plants are grown from seed. Normally the plants are planted in the final site because transplanting is difficult. Plants may get a soft heart due to boron deficiency. This is treated with borax.

Use: The red tubers are eaten after cooking. The root can be dried and powdered and mixed with barley or wheat flour. They can be pickled or fermented as beetroot juice. They are often boiled, sliced and served with vinegar. The leaves are edible. They are cooked in soups and stews.

Nutrients: root: energy; leaf: vit A, vit C, iron

Common name: Choko

Scientific name: *Sechium edule*

Cultivation: The entire fruit is planted as the seed cannot withstand drying out. It is planted flat and thinly covered with soil. Often chokos start to develop shoots and roots while they are still attached to the original plant. These eventually fall off and continue growing if they fall on soft moist dirt. A spacing 2 m apart along a fence is suitable. Trellis support is required. A well-drained fertile soil is needed.

Use: The fruit are edible when cooked. They can be pickled, baked, steamed, or made into fritters and puddings. The young leaf tips are eaten. The seeds can be eaten cooked. They are often deep fried. The fleshy root can be eaten cooked. They can be boiled, baked, or fried.

Nutrients: energy, protein, vit A, vit C

Acknowledgements:

This guide is based on information from the Food Plants International (FPI) database, "Edible Plants of the World", developed by Tasmanian agricultural scientist Bruce French AO.

"Food Plant Solutions Brief Guide to Food Plants in the Gold Coast region" is a limited selection of food plants intended as a **Draft Guide only** to identify some local food plants that have high levels of nutrients that are important to human nutrition. This guide has been developed with the best intention to create interest and improve understanding of the important local food plants in the Gold Coast region. It is not a comprehensive guide of food plants for Gold Coast region. Other important nutritious plants may be equally useful. Please contact Food Plant Solutions if you would like further information about these, or more detailed information about the ones selected.

Food Plant Solutions Rotary Action Group was initiated by the Rotary Club of Devonport North to assist in creating awareness of the edible plant database developed by Food Plants International, and its potential in addressing malnutrition and food security in any country of the world. In June 2007, Food Plant Solutions was established as a project of Rotary District 9830, the Rotary Club of Devonport North and Food Plants International. The primary objective of the project is to increase awareness and understanding of the vast food resource that exists in the form of local plants, which are well adapted to the prevailing conditions in which they are to be grown, and how this resource may be used to address hunger, malnutrition and food security. For more information, visit the website www.foodplantsolutions.org or email info@foodplantsolutions.org

Disclaimer: This Guide has been produced using information from the "Edible Plants of the World" database compiled by Bruce French of Food Plants International. Although great care has been taken by Food Plants International and Food Plant Solutions, neither organisation, or the people involved in the compilation of the database or this Field Guide:

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Always be sure you have the correct plant, and undertake proper preparation methods.