Potentially Important Food Plants of Nigeria

Rotary

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

A project of the Rotary Club of Devonport North and District 9830

www.foodplantsolutions.org

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Dedication

This book is dedicated to the 3 billion hard working farmers and families around the world who cultivate these and other food plants for their own subsistence, and who help conserve them in their rich diversity for other people to enjoy.

Bruce French (AO), agricultural scientist, founder of Food Plants International and developer of the "Edible Plants of the World" database.

Food Plant Solutions Field Guide – Nigeria, Version 3 (English), Nov 2025

Preface

This guide is based on information from the Food Plants International (FPI) database developed by Tasmanian agricultural scientist Bruce French, AO. The source material and guidance for the preparation of the book has been made possible through the support of Food Plants International, the Rotary Clubs of District 9830, particularly the Rotary Club of Devonport North who founded Food Plant Solutions, (previously the Learn◊Grow project), and many volunteers who have assisted in various ways.

The selection of plants included in this guide has been developed by Kabiru Adeniyi and John McPhee working in a voluntary capacity using the selection criteria developed by Food Plant Solutions. These selection criteria focus on the local plants from each of the main food groups with the highest levels of nutrients important to human nutrition and alleviation of malnutrition. It is intended as an indicative guide to indicate some important food plants that serve as examples for this purpose. Other important nutritious plants may be equally useful, and it is recommended that the FPI database be used to source information on the full range of plants known to occur in Nigeria. This guide has been developed with the best intention to create interest and improve understanding of the important local food plants of Nigeria, and on the understanding that it will be further edited and augmented by local specialists with appropriate knowledge and understanding of local food plants.

Food Plant Solutions 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, 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. More detailed or specific information on plants, including references to material by other authors, is available on DVD on request.

Always be sure you have the correct plant, and undertake proper preparation methods, by consulting with specialist scientists or local users of the plant. The Food Plants International database, from which the information in this Field Guide is drawn, is a work in progress and is regularly being amended and updated.

Contents

Introduction

Bruce French, AO – founder of Food Plants International (FPI) and developer of the FPI database
Edited by Food Plant Solutions

Potentially Important Food Plants of Nigeria has been produced to provide information on approximately 40 edible plants that are known to grow in Nigeria. These plants come from all the major food groups and have been chosen because of their high nutritional value. Many of the plants in this book may be neglected and under-utilised plants. This means they may not be well known. However, because they are high in many beneficial nutrients, and they are already adapted to the environment, and therefore likely to require minimal inputs, they could be important food plants that are likely to be superior to imported foods and plants. Commercially grown plants may also be included in the book, but only if they are significant foods for household consumption. It is hoped people will become confident and informed about how to grow and use these plants as many local food plants provide very good quality food.

Growing food

Growing food to feed a family is, without doubt, one of the most important things anyone can do. The more interest you take in your garden and the more you learn about plants and how to grow them well, the more interesting and fun food gardening becomes.

A country with very special plants

The local food plants of most countries have not been promoted and highlighted in the way they deserve. Visiting a local food market will quickly show what a rich variety of food plants can be grown in this country. Good information about these plants is often still in the minds and experience of local farmers and has not been written down in books. This can make it hard for the next generation of young people to find out how to grow them.

In many countries, some of the traditional food plants are only harvested from the wild and others are only known in small areas. Others have hundreds of varieties and are the main food for people in different regions. Information on all these plants, their food value and the pest and diseases that damage them is available in the Food Plants International database. The selection and use of plants adapted to a range of growing conditions is becoming even more important as climate change impacts production in a variety of ways in different regions.

Getting to know plants

People who spend time in gardens and with their food plants get to know them very well. It is a good idea to learn from someone who grows plants well. Each plant grows best in certain conditions and there are often special techniques in getting it to grow well. There are lots of unique things about every plant and learning about these helps a good gardener produce more food.

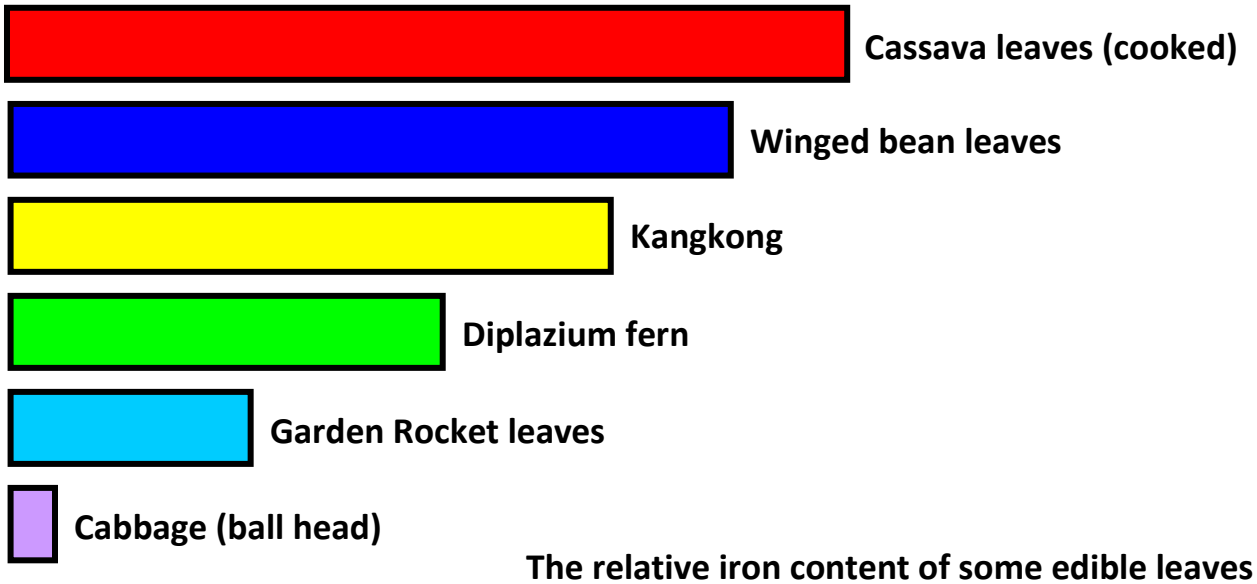
Naming of plants

Many food plants have local names, as well as a common English name. Every type of plant also has its own scientific name. Although the scientific name might not be widely recognised, this is the link by which people in different countries and with different languages can recognise the same plant. We know that many plants are grown in many different countries, but relying on local or common names, we might not recognise the same plant grown in different places. By using scientific names to accurately identify plants, we can get useful information from people in other countries. Wherever possible, plants in this book are named by their common English name and their scientific name.

Local food plants are often very good

People sometimes think that local food plants are not very special and that any food plant that is new or comes from another country must be a lot better. This is often not true. Many of the newer or introduced food plants, such as the round or ball head cabbages, have very little food value. Many traditional tropical green, leafy vegetables and ferns have 10 times or more food value as ballhead cabbage or lettuce. It is important to find out more information about the food value of different foods if we want to eat well. Citrus fruit, such as lemons and oranges, are often grown for vitamin C that helps keep people healthy. These fruits do not grow well in the tropics - the common guava fruit has three times as much vitamin C and is loved by children. This is just one example that there are often much better choices of local foods with higher levels of important nutrients.

Our bodies need a variety of food plants to enable us to grow, stay healthy and have enough energy to work. Different foods are needed to provide energy, protein, vitamins and minerals. The following diagram highlights the iron content value of some traditional edible, tropical plant leaves, compared with cabbage. Iron is a nutrient that is very important for our bodies and especially our blood. People who are short of iron become anaemic and lack energy.



The relative iron content of some edible leaves

A healthy balanced diet

Good nutrition, or eating a healthy balanced diet, is possible even with limited resources, space or means. If people eat a wide range of food plants, their bodies will normally get a balanced amount of all the different nutrients they require. If a nutrient is lacking in one food plant, then they are likely to get it from another plant if they are eating a range of food plants. For this reason, it is recommended to eat a range of different plant foods every day. For example, an important plant group for humans, particularly young people, is dark green leaves. A good serving of dark leafy greens per day provides the body with many vitamins and minerals, and fibre. There are many spices or flavouring plants that can improve the taste of foods, which helps save money on artificial taste enhancers. Taste should be considered separately from food value.

Learning to cook well

Even though some nutrients in food can lose some of their value during cooking, it is normally much safer to cook all food plants, at least for a short time. Bacteria, which cause diarrhoea, can occur in gardens and on food plants. These are killed during cooking. Many plants in the tropics develop cyanide, a chemical that makes them bitter and poisonous. This happens often with cassava

(tapioca, manioc) and beans, but can also occur in many other plants. It is recommended that tubers are peeled, soaked and then boiled for 15-30 minutes. Leaves should be pounded to a mash and then cooked in boiling water for 10 mins. Boiling the food for two minutes normally destroys cyanide and makes the food safe to eat. Some of the nutrients our bodies need (such as vitamin A for good eyesight) can only be absorbed or absorption is increased when consumed with a little oil or fat.

Learning to grow "wild" food plants

Many plants grow wild in the bush and are not cultivated by people. We can normally find someone who has taken an interest in them and has learned to grow them. This may be people from a different language group. It may be that in their area they have found better types than the ones that simply grow wild.

Saving better types of plants

If we simply allow plants to grow from seed, the improvements that have been made in finding sweeter or better types may get lost. Some fruit trees are like this and the fruit produced may not be sweet at all. It is often necessary to take cuttings from a tree to be sure the new plant is exactly the same as the old one. If the plants will not easily grow from cuttings simply by sticking a piece of the branch in the ground, there are other ways of helping these plants to form roots and start to grow. One good way is to make a small cut in the bark of a young branch and then wrap soil around the cut and cover it with plastic. With plants like guava, new roots will start to grow from this cut and grow into the soil wrapped around the branch. It can then be cut off and planted. This is called air-layering. A similar method is used with the roots of breadfruit. A shallow root is uncovered and a small cut made from which a new sucker will start to grow. This can be cut off and replanted.

Growing from cuttings and suckers

Many food plants are grown from cuttings and suckers. This is very important, as it allows all the different kinds of yams, taros, bananas, sweet potato and sugarcane to be continually grown and ensures the varieties are preserved. Each plant has its own special propagation method. It is important to use healthy planting material, as diseases can be spread in planting material.

Saving seed

Some food plants are grown from seed. Sometimes this is very easy as the seeds are large, store well, grow easily and grow the same as the original plant. It is more difficult with other plants. Many large fleshy seeds, such as breadfruit, need to be planted while still fresh as they do not store easily. Other seeds do not "breed true" or do not grow into new plants that are the same as the original plants. For example, the fruit may not be as large or sweet or have the same colour or taste. With many of these plants, it may be necessary to find ways of growing them from cuttings or other methods such as grafting. Some plants "inbreed" and get smaller or poorer. This happens when a plant self-pollinates or receives pollen from a close relative. Maize grown in small plots normally does this and the plants grown from seed grown in this situation get smaller and smaller each year. The seed needs to be saved from several different plants with different history and then mixed together before sowing. All the seeds on one cob are related and will inbreed. Some seeds develop a hard seed coat and need to be scratched, soaked in water, or even put into hot water, before they will start to grow. Saving local seeds is often a good idea as they are already adapted to local conditions. For example, seed saved from pumpkins grown locally will produce plants with less pest and disease damage than those grown from imported seed. *If you can't get seeds or planting material from local gardens – it is probably not a suitable local plant!*

Growing a garden of mixed plants

In nature, one variety of one plant never grows alone. There are always lots of different plants of different kinds and sizes, all growing together. Anyone familiar with natural environments will know this very well. The reason people all over the world want to save natural environments is because they have so many different kinds of plants all growing together. Growing plants in a food garden in a way similar to how they grow in nature, as a mixed group of plants, is very good agriculture. Mixing plants in a garden usually gives more reliable food production, as any disease from one plant will wash off in the rain onto a different plant, where it may not survive. Small plants fill the gaps and reduce the need for weeding.

Different types of plants for food security

There is another reason for growing a range of food plants in a local garden or around a village. If something goes wrong, like extreme insect damage to plants, some disease occurring in the garden, or a poor growing season, some plants will be more damaged than others. With a variety of plants, there will still be some food to eat until the other plants recover and grow again. Also, a wide variety of plants will mean that different ones will be maturing at different times, which helps ensure a continuous supply of food. There are shrubs that can be planted as edible hedges around houses, and fruit and nut trees that need to be planted as a gift for your children, several years before they will be able to enjoy them. Some nuts can be stored and eaten when other foods are not available. Most yams will store well for a few months.

Looking after the soil

Gardeners in traditional tropical agriculture usually move their gardens often by shifting to a new piece of land. There are usually three reasons for this:

- In the tropical lowlands, weeds can become a very big problem. There are usually a lot fewer weeds in the first year or two after clearing and burning the land, but weeds increase in the following years.
- Some of the nutrients in the soil are used each year and the soil becomes poorer and plants do not grow as well. There are ways of reducing this loss of nutrients.
- Very small worms called nematodes build up in the soil after a few years and get into the roots, especially of annual vegetable plants, and stop their roots working properly. For example, root knot nematode will cause the roots of plants like tomatoes and beans to become twisted resulting in poor growth of the plant.

Building up the soil

When a new garden has been cleared, it has lots of leaf mulch and other old plant material. This provides plant nutrients for new plants to grow. There is a simple rule for growing plants and improving the soil - “If it has lived once, it can live again.” Any old plant material can provide nutrients for new plants to grow, but it must be allowed to rot into mulch or compost for this to happen. If this plant material is burnt, some nutrients, especially phosphorus and potassium (“potash”), get left behind in the ashes for new plants to use, although it also allows these important nutrients to be lost by being washed away by rain. With burning, other important nutrients, such as nitrogen and sulphur, get lost in the smoke and disappear from the garden and soil. These last two plant nutrients are especially important for growing green leaves and when their levels are low, plants grow small or pale green. When nitrogen is lacking, the old leaves of the plant go pale and fall off early, and when sulphur is lacking, the young leaves go pale. Wherever possible, old plant material should be covered with some soil to allow it to rot down and not simply dry out or get burnt.

Poor soils where crops will not grow
When soils are very acid (or sour), plants cannot get the necessary nutrients. Natural chemicals in the soil that are toxic to plants when present at higher levels become soluble, get into plants, and stop them growing. Adding limestone to these soils can improve them. Using compost will not make them less acid, but will keep the plant nutrients in the soil in a more readily available form that plants can use.

Soil nutrients
Plants need 16 different kinds of plant food or nutrients in different amounts to grow properly. A plant that has already been growing will have these nutrients in them and probably even have them in a balanced amount. That is why composting old plant material is so important. Plants usually show some signs or symptoms if any of these nutrients is running out.

One of the most common and important nutrients for plant growth is nitrogen, which actually comes from the air, but gets into plants through the soil. When plants are short of nitrogen, their older leaves often become yellow or pale. When grass family plants, like sugarcane and maize, are short of nitrogen, the centre of the oldest (lowest) leaves starts to develop a dry or dead V-shape. The plant cannot find enough nitrogen in the soil so it gets it from an old leaf to grow a new leaf. This causes the old leaf to die, forming a characteristic V-shape in the centre of the leaf. The plant does not get any bigger as an old leaf dies each time a new leaf is produced. Village farmers often walk through grassland before they clear it for gardens, looking to see if the grass leaves are dry and dead, because they know gardens on this soil will not grow well. It is necessary to use compost or legumes (such as beans) to put nitrogen back into the soil. Growing plants from the bean family (legumes) is the most efficient way to increase the level of nitrogen in the soil.

Maize is a good plant for indicating which nutrients are running short in the soil. If the older leaves go dry along the edges, the soil is running out of potash. If leaves that are normally green develop a bluish colour, the soil is short of phosphorus. Generally, leafy crops need lots of nitrogen, and root crops need lots of potash.

Making compost
Compost is old plant material that has been allowed to rot down into a fine, sweet-smelling mulch that is full of nutrients that can be put back on the soil to grow new plants. Making good compost is very simple. A simple heap of plant material can be made in the corner of a garden or near a house. The composting process is carried out by small bacteria that live in the soil and feed on decaying plants. They break down old plant material into compost. These bacteria are living, so they need air, water and food. A good compost heap must have air, so do not cover it with plastic or put it in a container. This makes a foul-smelling compost, as different bacteria that don't need air turn it into an acid mixture that preserves it. Good compost must have moisture, so keep the heap damp, but not too wet. The compost bacteria like a balanced diet, which means that both green material and dried material is needed to balance the carbon and nitrogen in the compost pile. If the compost material gets too dry and brown, it will not break down, and if it gets too green, it will go slimy. Using a little bit of compost from an old heap will make sure the right bacteria are there to start the whole process off. As soon as the plant material is broken down to a fine mulch it can be put onto the garden. It is best if it is dug in, but if it is regularly put onto the surface of the garden, worms will mix it into the soil.

Pests
There are a large number of insects that enjoy sharing our food with us! We should not try to kill all these insects as they have an important role to play in keeping everything in nature in balance. What

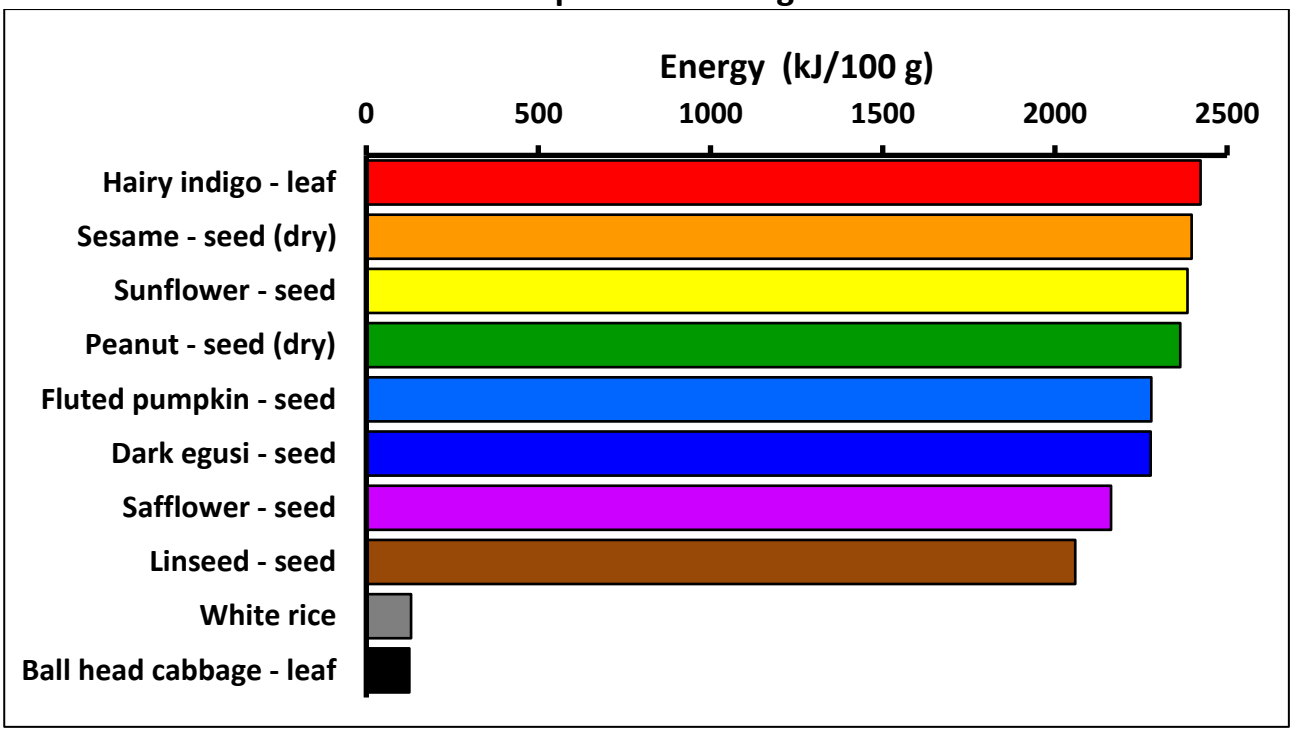
we need to do is to learn to manage these insects so we can all get some food to eat! Some insects are attracted to lights, and if the garden is near village lights some insects can cause a lot of damage. If large areas of one particular crop are planted, insects can breed more quickly and cause a lot of damage. As an example, insects called armyworms can breed up in large numbers on the shade trees of cacao and then move “like an army” into gardens. Some insects are large and breed slowly and can be picked off and removed. The large, green grubs with pointy tips that hide under taro leaves are best controlled by simply picking them off. Some insects, like taro beetles, can be a serious problem, but the young curl grubs of this insect are tasty if you catch and cook them. Some insects do not like sunlight. The very small moth than damages banana fruit is like this. Simply pulling off the leafy bracts over the banana fruit reduces the damage, as this lets sunlight in and the insect flies away. The best rule for reducing pest damage is to grow healthy plants, as they suffer less damage.

Diseases

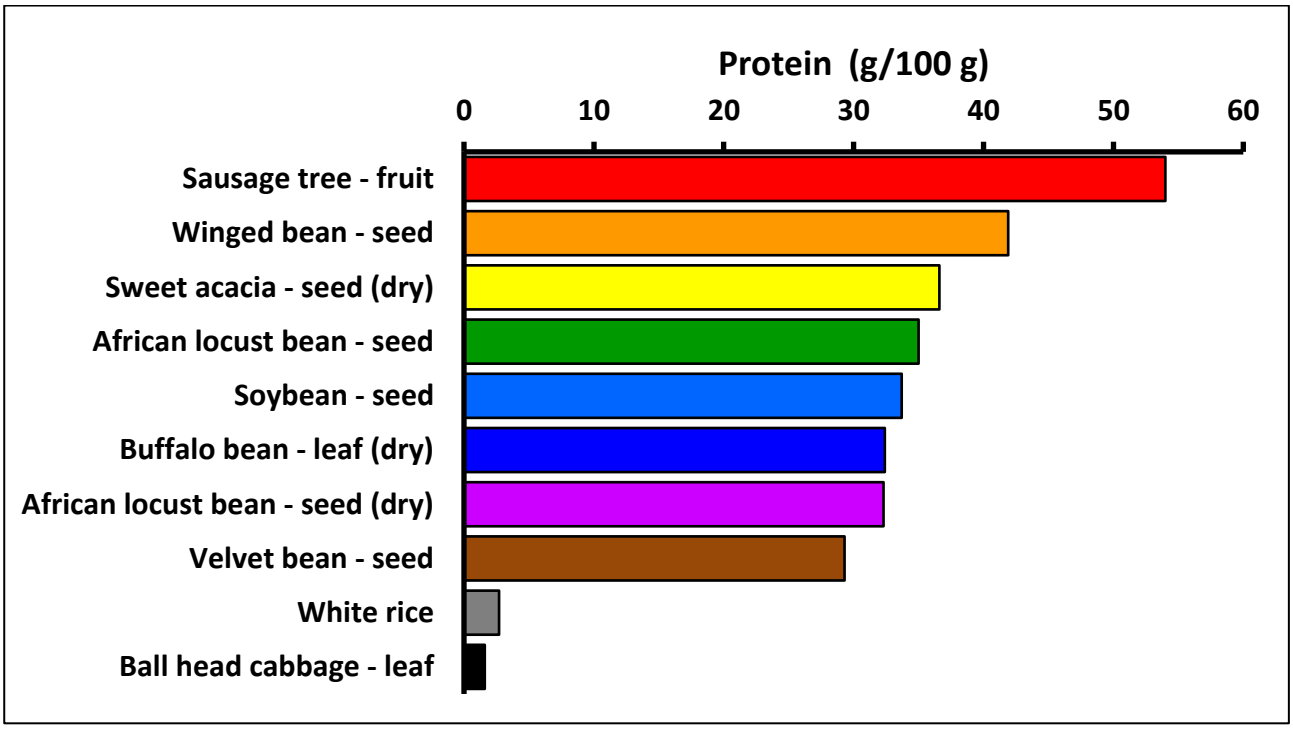
The living organisms that cause disease are much smaller than insects. These disease organisms can often only be seen with a microscope. There are three main kinds of disease organisms - fungi, bacteria and viruses. Fungi are like the mushrooms we eat, only very much smaller. They usually make distinct dry spots on leaves and other plant parts. Fungi have spores that often blow in the wind. Bacteria are often smaller and live in damp places. They usually make plants go soft and squashy, and they may cause a smell. Bacteria are mostly spread with rain and in water. Viruses are very, very small and usually make irregular stripes and patterns on leaves and other plant parts. Viruses usually spread in planting material or in the mouths of small sucking insects. One common fungus disease on sweet potato causes the leaves to become wrinkled and twisted. It usually gets worse in old gardens and where soils are running out of nutrients. It does not affect all kinds of sweet potato to the same extent. The answer is not to stop the disease, but to improve the soil. The general rule is that healthy plants that are growing well will suffer less damage from disease.

Unless otherwise indicated, images in this publication have been sourced from the Food Plants International database (www.foodplantsinternational.com).

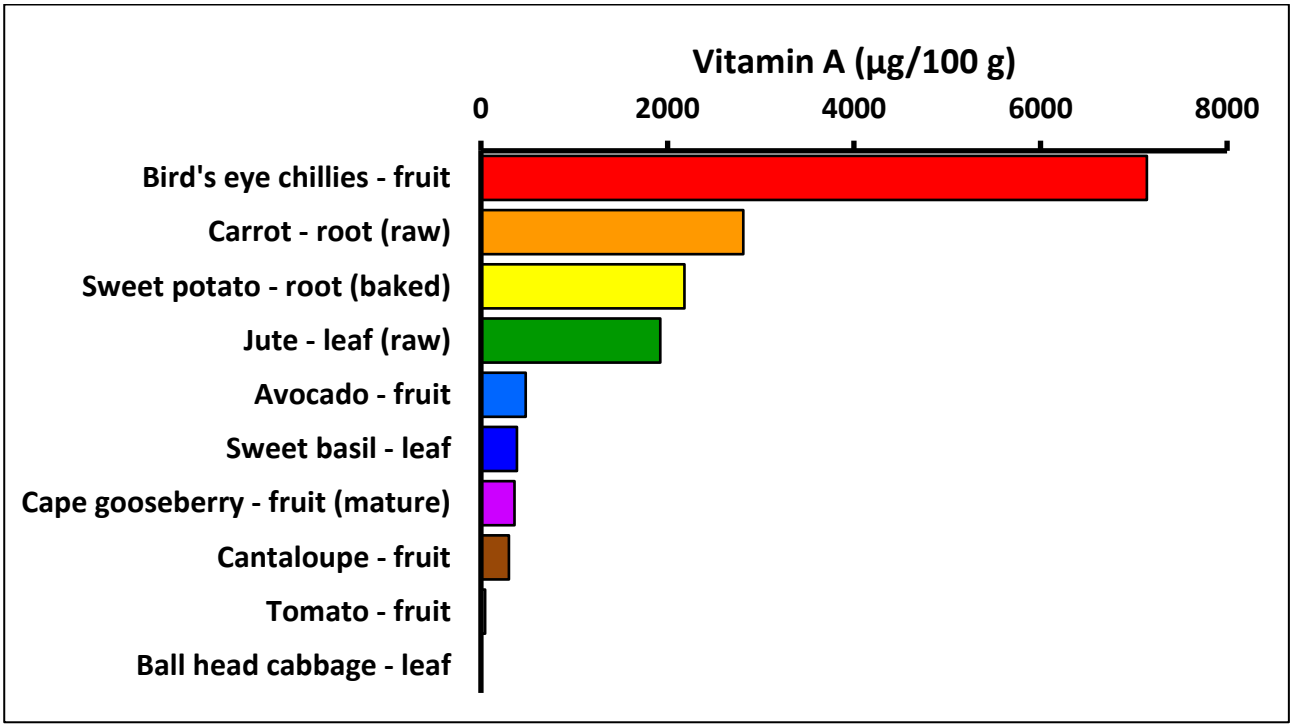
Food value charts for a selection of plants from Nigeria



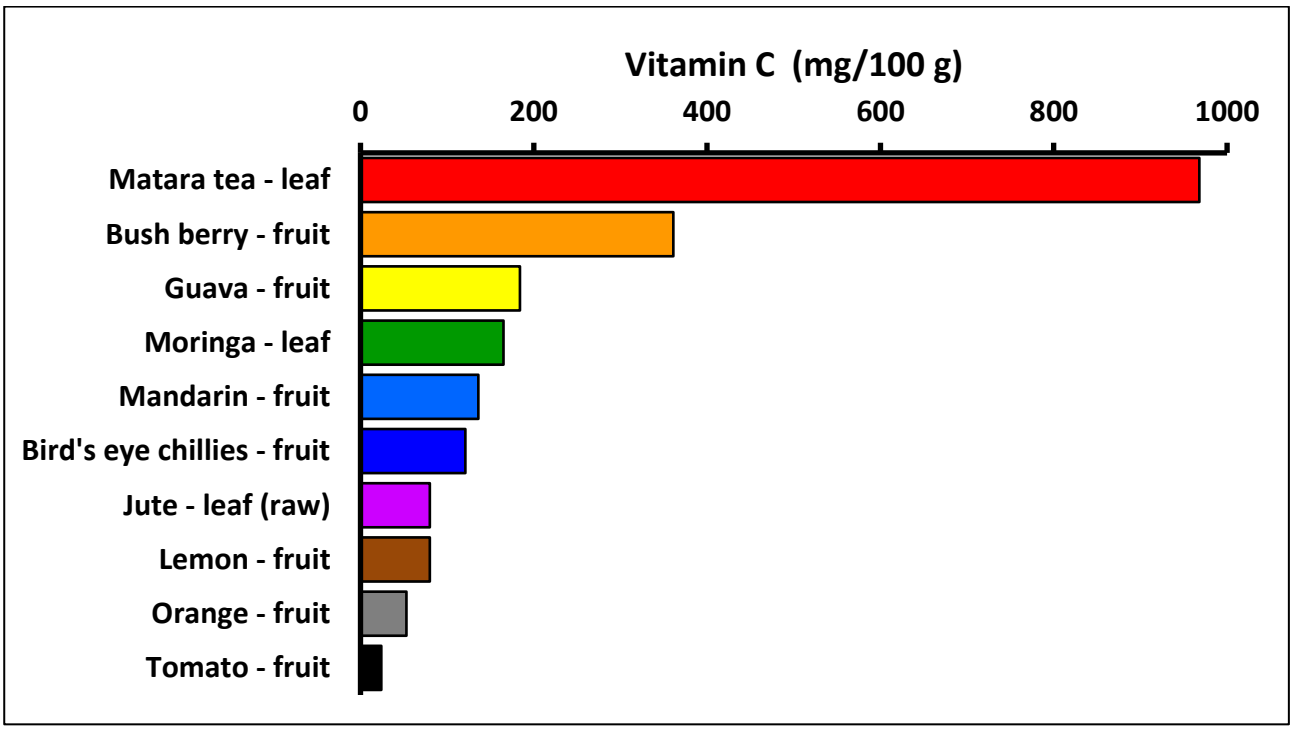
Energy is important for growth and repair of the body, thinking, breathing, blood flow and movement for work, exercise and play. All foods provide energy but foods containing oils, such as oil seeds, and starch, such as cereal grains and tubers, are particularly high in energy.



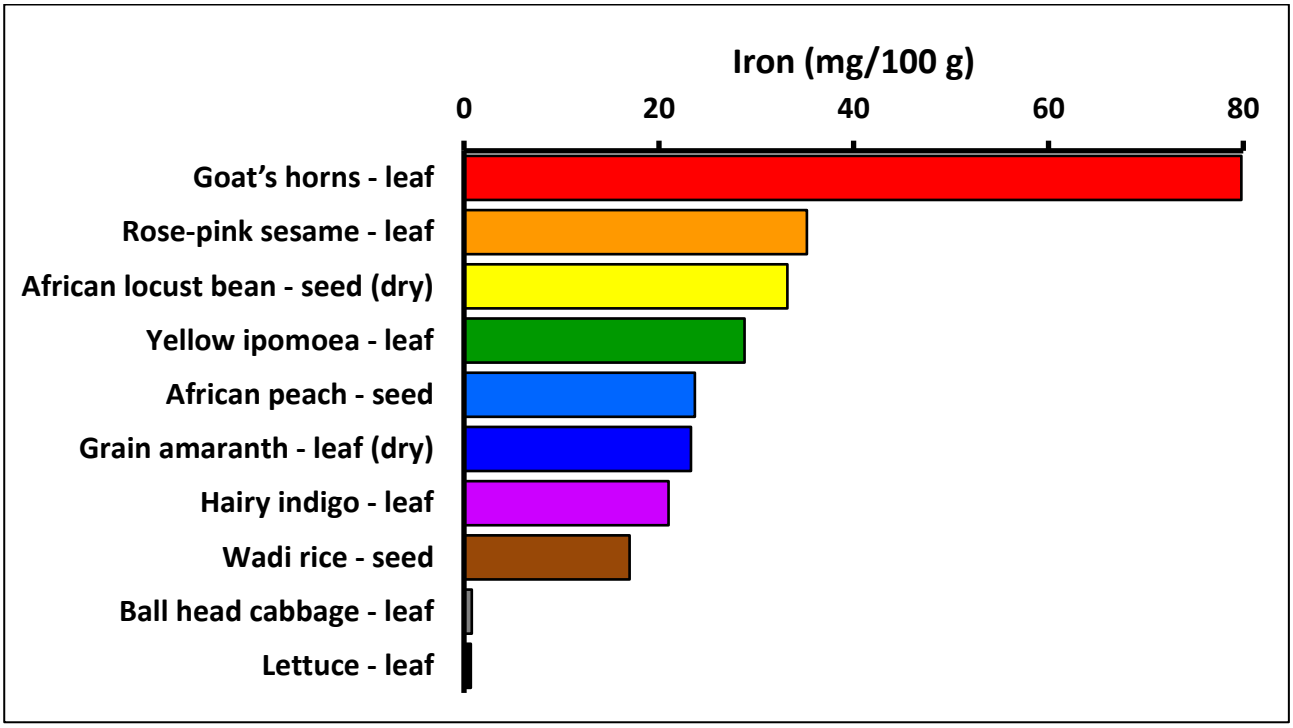
Protein helps the body repair, maintain and create cells. Protein is also important for growth and development in children, teens, and pregnant women. Symptoms of protein deficiency include wasting and shrinkage of muscle tissue, fatigue, reduced immunity, brittle hair and nails, and poor growth (in children).



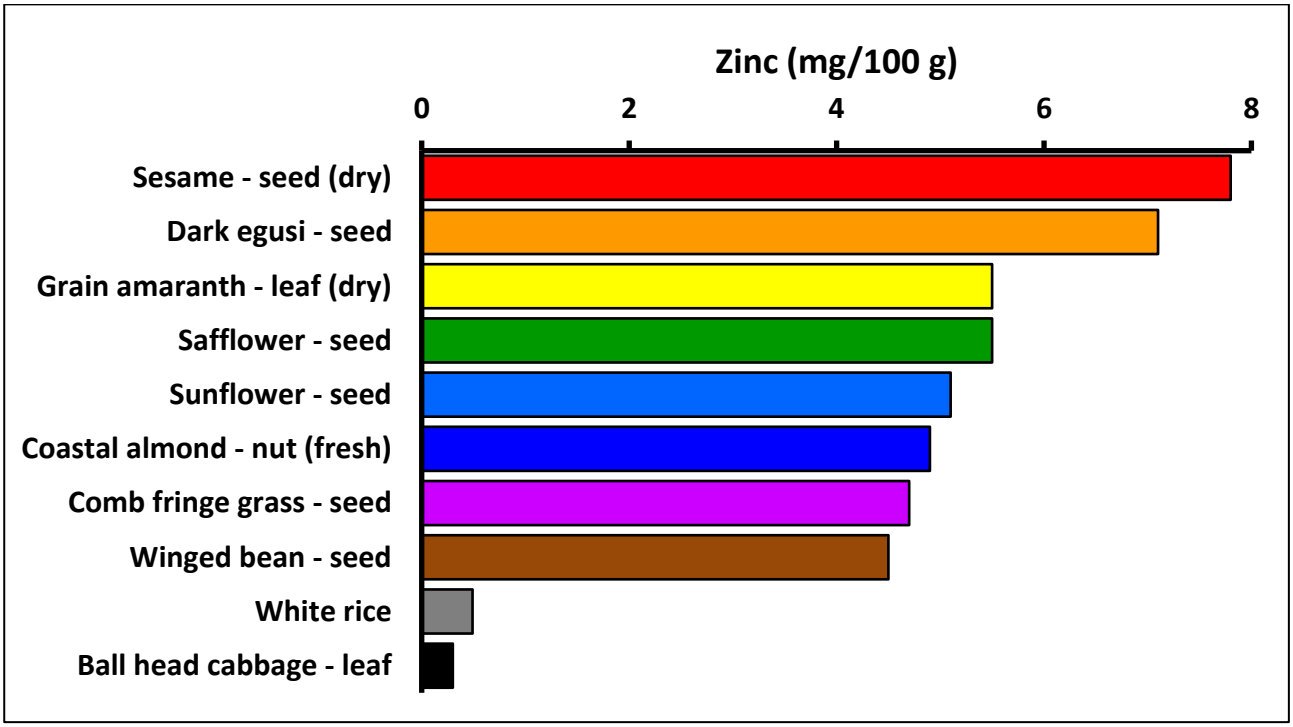
Vitamin A is very important for eyesight and fighting disease, particularly in infants, young children and pregnant women. People who are deficient in vitamin A have trouble seeing at night.



Vitamin C helps us avoid sickness, heal wounds, prevent infections and absorb iron from food. Vitamin C deficiency presents with swollen, bleeding gums and easy bruising, severe deficiency causes scurvy, with symptoms of fatigue, red/purple skin spots, slow wound healing and open sores, nosebleed and painful, swollen joints.



Iron helps create red blood cells that carry oxygen from the lungs to the rest of the body. It supports energy levels, cognitive function and immunity. It is especially important for children and pregnant women. Low levels of iron cause anaemia, which makes us feel fatigued, weak and have difficulty concentrating. Iron absorption is increased when Vitamin C is also present.



Zinc is important for growth and development in children and teenagers, and aids recovery from illness. Zinc supports the immune system through cell division, cell growth, wound healing, and breakdown of carbohydrates. Zinc is also needed for the senses of smell and taste. Zinc deficiency leads to stunted growth, loss of appetite and impaired immune function with frequent infections.

Note regarding plant selection: In compiling these field guides, we acknowledge that some widely grown staple foods and commercial crops may be omitted. This does not mean they are not useful but merely reflects a desire to concentrate on plants that are less well known and/or underutilised.

Starchy staples

Common name: Floating rice
Local:

Scientific name: *Oryza glaberrima*
Plant family: POACEAE

Description: An annual grass. Most varieties have a reddish colour. It grows to 1.5 m tall but can be up to 5 m in some floating kinds. Dryland types often form tufts and floating rice often branches. The leaves are alternate and simple. The leaf sheath is 25 cm long. The leaf blade is 20-25 cm long and 6 -9 mm wide. The flowers are in a compact group 25 cm long at the top of the plant. The fruit is a grain 9 mm long by 3 mm wide.

Distribution: It is a tropical plant that grows in swamps and on flood plains of savanna regions. It does best with temperatures of 30-35°C. It grows from sea level to 1700 m altitude and can tolerate low soil fertility.

Use: The grain can be cooked and eaten, or ground into flour. This is sweetened with rice flour and honey for bread. It is fermented for beer.

Cultivation: Plants are grown from seed. Usually seeds remain dormant for a few months after harvesting. Seed usually emerge after 4-5 days. Seed are usually broadcast without using a nursery. The juvenile stage lasts for 3 weeks then tillering occurs for 3-4 weeks.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	11.3	1538	7.4	-	-	3.4	-

Image sourced from: https://i.pinimg.com/474x/77/48/1f/77481fb8134243595c851b56ac63ea4c--natural-resources-mali.jpg

Starchy staples

Common name: Wadi rice
Local:

Scientific name: *Oryza punctata*
Plant family: POACEAE

Description: A grass that grows in water. The stems are spongy, grow 60-90 cm high and are stout.

Distribution: A tropical plant that grows in swampy streams in West Africa.

Use: The seeds have the hulls removed and are then boiled and eaten.

Cultivation:

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	-	1482	13.9	-	-	17	3.9

Image sourced from: https://5.imimg.com/data5/OA/OK/TT/SELLER-12342730/oryza-punctata-red-rice--500x500.png.

Starchy staples

Common name: Hungry rice
Local:

Scientific name: *Digitaria exilis*
Plant family: POACEAE

Description: An erect millet grass that grows from seed every year. It grows about 50 cm high. It forms tillers or new shoots are the base of the stem. The leaves are narrow. They can be 15 cm long. It has 2-4 racemes per inflorescence. These are 15 cm long. The grains are very small and usually yellow. They are about 1.5 mm across.

Distribution: A tropical plant that can grow on poor, shallow soils. It grows on the edge of the Sahel and in the savannah. It can tolerate drought and grows in arid locations. It can grow with 400 mm average rainfall. It can grow in acidic soils with a high aluminium content. It grows in areas with a temperature between 20°C-30°C. In West Africa it grows between sea level and 1500 m above sea level.

Use: The grain can be cooked for porridge or used in couscous. It can also be popped over a hot fire. It is ground into flour and used for bread and as a base for semolina.

Cultivation: Plants are grown from seed. Seed are sown very close together. They probably need a temperature above 25°C to germinate.

Production: The growing period is 3-4 months. The plants are harvested with a sickle and tied into sheaths. These are dried then threshed and hulled with a mortar. Yields of 600-800 kg per hectare are average. Some varieties reach maturity in 40 days.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (raw)	11.2	1470	7.1	0	-	8.5	0.82
seed (cooked)	63.0	613	2.9	0	-	3.5	0.61

Image sourced from:
https://www.feedipedia.org/sites/default/files/images/Grains%20de%20fonio%20d%C3%A9cortiqu%C3%A9%20(JF%20Cruz%2C%20Cirad).jpg

Starchy staples

Common name: Black acha
Local:

Scientific name: *Digitaria iburua*
Plant family: POACEAE

Description: A wild millet grass. It is slightly taller than Fonio (*Digitaria exilis*). It forms loose tufts and grows 1.4 m tall. It has 4-10 racemes per inflorescence. The spikelets are dark brown but the grain is white.

Distribution: A tropical plant. It is cultivated as a cereal in the Hausa region in northern Nigeria. It grows between 400-1000 m altitude in West Africa. It grows in areas with a rainfall of 900-1000 mm per year. It grows in the savannah.

Use: It is used in the preparation of a couscous locally known as *wusu-wusu.* It is used to prepare beer.

Cultivation: It is often grown intercropped with sorghum or pearl millet. It is also grown mixed with Fonio (*Digitaria exilis*).

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (raw)	10.3	1470	8.9	-	-	10.0	-
seed (cooked)	62.6	622	3.7	-	-	4.1	0.82

Image sourced from:
https://th.bing.com/th/id/OIP.5EUQrBQ1Zu2BjQSg1x0UXQHaO0?pid=ImgDet&w=175&h=350&c=7&dpr=1.5

Starchy staples

Common name: Sorghum
Local:

Scientific name: *Sorghum bicolor*
Plant family: POACEAE

Description: Sorghum is a millet grass. A mature sorghum plant resembles maize in its stature. Plants vary in height from 45 cm to 4 m. It is an annual grass with erect solid stems. The stems can be 3 cm across at the base. Prop roots occur at the base of the plant. There are numerous sorghum varieties. Some have one main stem while others produce multiple tillers. More tillers are produced when plants are widely spaced. The nodes on the stem are slightly thickened. Short types have up to 7 leaves while tall late varieties may have up to 24 leaves. The leaf blade can be 30-135 cm long. Leaves are bluish green and waxy. They have a prominent midrib. The large flower panicle can be 20-40 cm long. The flower occurs at the top of the plant. It can stick upright or bend over. The flower can be open or compact. Over 1000 cultivated varieties occur in China.

Distribution: Sorghum is a tropical plant. It suits the savannah zones in the tropics and can tolerate heat and drought. It can recover from drought even as a seedling. It can tolerate water-logging. It can be grown on heavy or light soils. Sorghum requires short day lengths to flower. Many kinds are adapted to specific day length and rainfall patterns. It suits hardiness zones 9-12.

Use: Sorghum seeds are eaten as a cereal. Flour can be made from the grain and then used for porridge or other dishes. It is used for dumplings, fried cakes and drinks. It cannot be used for bread as it contains no gluten. The stems of some kinds are sweet and can be chewed. The grains can be popped and eaten. The sprouted seeds can also be eaten.

Cultivation: Sorghum seeds will germinate soon after harvest. The seeds also store well if kept dry and protected from insects.

Production: Grain is ready for harvest 4-8 weeks after flowering.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	-	1459	11.1	-	-	-	-

Starchy staples

Common name: Bullrush millet
Local:

Scientific name: *Pennisetum glaucum*
Plant family: POACEAE

Description: An annual grass that grows to 3 m tall. The leaf blades are 20-100 cm long by 2-5 cm wide. The flower is dense and 40-50 cm long by 1.2-1.5 cm wide. They also vary in shape and size. Plants that tiller produce smaller heads. The species varies a lot. There are 13 cultivated, 15 weed and 6 wild races of this grass. It has a cylindrical ear like a bullrush. The grains are small and round and have a shiny grey colour like pearls. There are thousands of cultivated varieties.

Distribution: A tropical plant that suits regions with a short growing season. It grows in areas with less than 600 mm of rainfall. It is replaced with sorghum between 600-1200 mm rainfall and then by finger millet or maize above 1200 mm rainfall. It is important in the drier areas of India and Pakistan. It can grow in arid places.

Use: The seeds are eaten like rice. They are also ground into flour and made into bread and cakes. They are used to make alcoholic drinks. They are mixed with other grains and seeds to make fermented foods. Some kinds have sweet stalks that are chewed. The young ears can be roasted and eaten like sweet corn.

Cultivation: Plants are grown from seed. It is usually sown directly into the field. The plant density is adjusted to suit rainfall and soil fertility. The spacing is 45 cm apart up to 200 cm apart. It is also intercropped with other crops such as cowpea, sorghum and peanut. Crops are normally weeded 2 or 3 times.

Production: It takes from 75-180 days to maturity. The heads can be picked by hand or the plant removed. Some types need to be picked 2 or 3 times as heads mature.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	11.6	1442	10.5	-	-	6.5	1.7

Starchy staples

Common name: Comb fringe grass
Local:

Scientific name: *Dactyloctenium aegyptium*
Plant family: POACEAE

Description: An annual grass. The stems are slender. They can lie along the ground. These can form roots at the nodes. They can have runners and form mats. It is 15-60 cm high. The edges of the leaf sheaths have small hairs. The leaf blades are flat and 5-20 cm long by 0.2-0.6 cm wide. The surfaces are lumpy/hairy. It tapers to the tip. The flowers spread like fingers on a hand. There are 2-9 flower stalks. They are long and narrow. They often spread out horizontally. The spikes are on one side of the stalk. The tip is bare. The seed grains are about 1 mm across.

Distribution: A tropical plant. It grows in disturbed weedy places especially on sandy soils in S China. It grows in tropical to warm temperate regions. It grows on clayey, sandy or black soil along the borders of ponds, swamps and bogs. In West Africa it grows from sea level up to 2000 m altitude. It grows in alkaline and salty soils. It grows in areas with an annual rainfall between 100-1580 mm. It can grow in arid places.

Use: The seeds are husked then boiled into a porridge. They are also roasted in a hot pot to soften them. It is then pounded into flour and cooked into porridge. The rhizome or runners are eaten raw.

Cultivation: Plants can be grown from seeds.

Production: The seeds are collected during the dry season. The seeds can be stored for several months.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	7.5	1234	9.8	-	-	6.9	4.7

Image sourced from: https://www.feedipedia.org/node/465

Starchy staples

Common name: Durum wheat
Local:

Scientific name: *Triticum durum*
Plant family: POACEAE

Description: A clumping grass. It grows 0.9-1.5 m high and spreads 30-50 cm wide. The leaves are narrow, flat and rough. They are strap like. The flower stems are smooth and hollow. The flowers are in dense, somewhat flattened spikelets. These do not have stalks. The seed heads usually have beards. The seed are hard and oval and can be white, red or yellow.

Distribution: It has drought resistance. It suits hardiness zones 9-11.

Use: It is used for semolina and pasta. It is used in spaghetti, noodles, cakes, puddings and some breads and in couscous. It is made into porridge.

Cultivation: Seed should be sown into a clean weed free seedbed. Seeds can be broadcast or drilled. Seed should be 2.5-5 cm deep and plants 20-25 cm apart.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	12.5	1387	11.7	-	-	3.3	-

Image sourced from: https://cdn.britannica.com/18/122518-004-991B8B12/Field-durum-wheat.jpg.

Starchy staples

Common name: Love grass
Local:

Scientific name: *Eragrostis ciliaris*
Plant family: POACEAE

Description: A tufted annual grass. It grows 5-60 cm high. The leaf blade is flat and 12 cm long by 5 mm wide. The flower panicle is like a spike but interrupted. It is 1-20 cm long and woolly. The spikelets have 6-12 flowers. The seeds are up to 0.5 mm long.

Distribution: A tropical plant. It can grow in sandy locations including pure coastal sand. In West Africa it grows from sea level to 1400 m elevation.

Use:

Cultivation:

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	10.6	1367	16.7	-	-	-	-

Image sourced from: https://inaturalist-open-data.s3.amazonaws.com/photos/78694669/original.jpeg

Legumes

Common name: Winged bean
Local:

Scientific name: *Psophocarpus tetragonolobus*
Plant family: FABACEAE

Description: A climbing perennial bean up to 4 m tall. It can re-grow each year from the fattened roots. Stems twine around supports or trail over the ground. Leaves have 3 leaflets 8-15 cm long with long leaf stalks. Flowers are blue or white and occur on the ends of branches from within the axils of leaves. Pods have wavy wings and are roughly square in cross section, 6-36 cm long with 5-30 seeds. Seeds can be white, yellow, brown or black and are bedded in the solid tissues of the pod. They are round and smooth with a small hilum. The root has large nodules.

Distribution: A tropical plant that grows from sea level up to about 1850 m altitude in the tropics. It normally only produces tubers at 1200-1850 m altitude. It needs a day length less than 12 hours. It will not produce flowers or pods at places far from the equator. The main areas of production are between 20°N and 10°S latitudes. It is ideally suited to the tropics including the hot humid lowlands. For maximum seed production, temperatures of 23-27°C are needed, and for tubers the temperatures should be 18-22°C. Winged beans grow on a wide variety of soils and on soils with pH from 3.6-8.0. They are sensitive to acid and waterlogged soils.

Use: Young leaves and pods, flowers, ripe seeds and root tubers are edible. The seeds can be used to extract an edible oil.

Cultivation: Seeds are sown at the beginning of the rainy season. Seeds germinate and grow slowly for the first 3-5 weeks. For tubers, vines are pruned off at about 1 m high (or left unstaked) and some flowers are removed. Cultivation procedures vary slightly depending on which part of the plant is to be eaten. Short podded winged bean is used for tubers and long podded ones have poor tubers. Tuber production is not as efficient in tropical lowland conditions.

Production: The first green pods are ready about 10 weeks after sowing. Tubers are ready after 4-8 months. Seed yields of 1.2 tons/ha and tuber yields of 4 tons/ha are possible. A single plant can produce up to 75 pods. Dry bean yields of 45-330 g per plant can be produced depending on variety. Tuber yields of 5500-12000 kg per hectare have been produced. Seeds can contain a trypsin inhibitor which reduces protein digestibility. This inhibitor is destroyed by soaking seeds then boiling them well. Tubers can also contain this chemical and need to be well cooked.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	8.5	1764	41.9	-	-	15.0	4.5
pod (fresh)	92.0	105	2.1	-	-	-	-
leaf	95.0	197	5.0	809	30	6.2	1.3
seed (young)	87.0	205	7.0	13.0	18.3	1.5	0.4
root	57.4	619	11.6	-	-	2.0	1.4

Legumes

Common name: Sweet acacia
Local:

Scientific name: *Acacia farnesiana*
Plant family: FABACEAE

Description: An evergreen shrub. It grows 5-7 m tall and 3 m across. The stem is slender and erect. The crown is open. It is a spreading, densely branched shrub. The bark is smooth and brown. The leaves are branched and green. There are 4-6 pairs of larger leaves and 10-20 pairs of small leaflets. They have tiny leaflets and thorns up to 2 cm long, occur in pairs. The leaf stalk has a gland at or above the middle. The flowers are large orange balls. They are strongly perfumed. (The oil is used as a perfume in France.) The pods are long and dark brown to black. They are 5-8 cm long by 0.5-1 cm wide. They are inflated and sausage like. Often they are curved. They are marked with narrow lines. The pods have hard grey seeds imbedded in a pithy substance. The pods do not split open at maturity. The seeds are chestnut brown and 7-8 mm long by 5.5 mm wide.

Distribution: It is a tropical plant. This tree occurs naturally in Australia, Asia and Africa. It will grow on most soils. It is drought and frost resistant. It most commonly grows naturally on clay soils. In Papua New Guinea the plants are coastal below 60 m altitude. It grows in areas with an annual rainfall between 400-4000 mm. It can grow in acid or alkaline soils. It can grow in arid places. It suits hardiness zones 11-12.

Use: The pods have been recorded as eaten after cooking. The gum is eaten. The ground up seeds are eaten. The germinated seeds are claimed to be eaten. The gum is used to prepare sweets. The young leaves are used in India as a substitute for tamarind in chutneys.

Cultivation: It is grown from seed.

Production: It is fast growing. Flowering can occur almost continuously if watering is regular. In northern Australia, flowering is normally May to July, with pods available from September to November.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (dry)	8.1	1522	36.6	-	-	6.0	0.6

Legumes

Common name: African locust bean
Local:

Scientific name: *Parkia biglobosa*
Plant family: FABACEAE

Description: A large tree that grows to 20 m tall. The trunk is 1 m across. The crown is spreading. The bark is scaly. The leaves are dark green and twice divided. There are 50-70 pairs of leaflets along 14-30 pairs of leaflet stalks. The flower clusters are pink or red. These are in round balls on stalks 30 cm long. The fruit are pods 50 cm long. A cluster of pods occur together. The ripe seeds develop a yellowish tinge when ripe. There is pink, dry, powdery flesh around them. The fruit are edible.

Distribution: It is a tropical plant that often grows near water. It grows in the Sahel and in savannah. It grows in areas with a rainfall between 500-700 mm per year. It grows best on deep loamy sands. It can grow in arid places.

Use: The seeds are normally roasted. They are then bruised and allowed to ferment in water. They are then washed and ground into powder that can be stored for long periods. The seeds can be processed into a vegetable cheese. This is used as a spice to season sauces and soups. The flesh of the fruit is edible. A drink is also made from the flesh of the fruit. The bark is used in relishes and chutneys as a flavouring.

Cultivation: Plants can be grown from seeds. The seeds are put into boiling water then allowed to cool to improve their germination. They can be transplanted after 10-14 weeks. Plants can be grown from root suckers or be budded.

Production: Initial plant growth is slow. First fruit develop after about 8 years. Flowers and fruit develop during the dry season.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed		-	35	-	-	-	-
fruit	4.0	-	5.3	-	29	-	-

Image sourced from: https://www.feedipedia.org/sites/default/files/images/african%20_locust_bean_flower.jpg

Legumes

Common name: Soybean
Local:

Scientific name: *Glycine max*
Plant family: FABACEAE

Description: A small erect bean growing up to 60 cm tall. It grows each year from seed. Straggling kinds can occur. Stems, leaves and pods are softly hairy. The leaves have 3 leaflets. The leaflets have stalks. Flowers are small and white or blue. They occur in groups in the axils of leaves. The pods are broad, flat and hairy. Pods have 2-4 seeds. The seeds can be yellow to black.

Distribution: It is a temperate plant that suits lowland areas. It can be grown from sea level to 2000 m altitude. Many varieties will not flower in the tropics (short days). It needs fertile soil. The best soil acidity is pH 5.5-7.0. It is damaged by frost.

Use: The young pods and ripe seeds are eaten. They are used for flour. The dried seeds are boiled or baked and used in soups, stews and casseroles. The seeds are used for oil. Toasted seeds are eaten like a snack. Strongly roasted seeds are used for coffee. Soy flour is used for noodles, and confectionary. The beans are fermented and used in a range of foods. Sometimes the young leaves are eaten. The seeds are also used for sprouts and for making cooking oil and soya sauce etc. Because soybean contains a trypsin inhibitor they should be cooked and even the sprouts should be lightly cooked.

Cultivation: It is grown from seed. Seeds need to be inoculated with bacteria before planting. Plants need to be about 20 cm apart.

Production: Plants flower about 8 weeks after sowing and pods mature about 16 weeks after sowing. Often plants are pulled up and hung up before threshing out the seed.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	9.0	1701	33.7	55	-	6.1	-
seed (immature)	68.0	584	13.0	16	27	3.8	0.9
sprout	79.5	339	8.5	1.0	8.3	1.3	1.0

Legumes

Common name: Buffalo bean
Local:

Scientific name: *Mucuna poggei*
Plant family: FABACEAE

Description: A bean family plant that is a woody creeper with stem up to 30 m long. The stems can be 20 cm across. The sap makes a dark brown stain. The leaves are alternate and have leaflets along the stalk. The leaflets can be 10-19 cm long by 6-19 cm wide. The side leaflets are unequal. The flowers hang in a group in the axils of leaves. The flowers have orange-red hairs. The fruit is an oblong pod 5-20 cm long by 4 cm wide. It is covered with red bristles that irritate the skin. The pod contains 1-5 seeds. The seeds are curved and 2.5 cm long by 2 cm wide and flattened. They are purple with brown marks.

Distribution: It is a tropical plant. It grows near rivers and swamps from sea level to 2000 m elevation.

Use:

Cultivation:

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf (dry)	8.3	-	32.4	-	-	10.6	0.24

Image source from: Mucuna - Wikipedia

Legumes

Common name: Velvet bean
Local:

Scientific name: *Mucuna pruriens*
Plant family: FABACEAE

Description: An evergreen herb or shrub. It is a climbing vine. It climbs to 6 m high. It can re-grow each year or live for a few years. The stems are slender with long, slender branches. They are very hairy when young. The leaves are alternate with sword shaped leaves. The leaf stalks are hairy. There are 3 leaflets. The leaflets are 5-19 cm long and 4-16 cm wide. The leaflets are rounded at the base and the side leaflets are unequal in shape. The flowers are large and white with bluish butterfly shaped petals. They occur in clusters of 2 or 3. The flowers are 2-4 cm long. The fruit are thick, leathery pods covered with hairs. They are 10 cm long and contain 4-6 seeds. The pods are dark brown.

Distribution: It is a tropical plant. It does best in a rich, moist, well-drained soil. It needs a protected, sunny position. It is damaged by drought and frost. It grows from sea level to 900 m above sea level. They need a temperature above 8°C. It can grow in arid places.

Use: The pods are burnt over a fire to remove the prickles then the beans are soaked until they sprout and then washed and boiled or pounded. The young leaves are cooked as a vegetable. The ripe seeds are roasted and eaten. **Caution:** The seeds need special preparation by repeated boiling before eating.

Cultivation: Plants are grown from seed. The seeds need treatment to assist them to germinate.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	7.3	-	29.3	-	4.8	-	-

Legumes

Common name: Honey bean
Local:

Scientific name: *Vigna unguiculata subsp. catjang*
Plant family: FABACEAE

Description: An annual climbing herb. It grows 7-13 m long. It has erect pods. The pods are 8-20 cm long and 5 mm wide. The seeds are oblong. They are 5-6 mm long.

Distribution: A tropical plant.

Use: The seeds are eaten. The young pods are eaten as a vegetable.

Cultivation:

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (dry)	7.5	1476	22.8	-	-	-	-
seed (young)	82.0	291	3.8	-	-	3.6	-

Image sourced from: https://mplant.ump.edu.vn/wp-content/uploads/2021/05/dau-den.jpg

Legumes

Common name: Sword bean
Local:

Scientific name: *Canavalia gladiata*
Plant family: FABACEAE

Description: A climbing or sometimes bushy and upright bean plant. Mostly it is a climber that can grow up to 4 m long. The leaves have 3 large leaflets. The leaflets are oval and 7.5-20 cm long by 5-12 cm wide. The top of the leaf can narrow abruptly to a tip while the base can be rounded or broadly wedge shaped. The leaves are slightly hairy on both surfaces. The leaf stalk is 5-12 cm long. The white flowers occur in a cluster 7-12 cm long with a stalk 4-20 cm long. The individual flower stalks are 2 mm long. The pods are long (20-40 cm) and curved. Seeds are coloured red or pink. The hilum is dark brown and almost as long as the seed.

Distribution: A tropical plant. Temperatures of 20-30°C suit it well and it grows from sea level to about 1000 m altitude in equatorial zones. They are drought and salt resistant. They can grow on lowland tropical nutrient depleted soils and on soils with pH from 4.5-7.0. They can tolerate some shade.

Use: Young pods are cooked and eaten. Seeds can be cooked and eaten, but the water should be changed and they should be well boiled. They are also fermented. The leaves are blanched and eaten. **Caution:** The seeds can be poisonous due to hydrocyanic acid and saponin. Cooking will remove these.

Cultivation: They are grown from seeds. Seeds germinate readily and the plant is relatively fast growing. Seeds can be sown 5 cm deep. Plants should be 60-70 cm apart. Climbing types need support. Often natural supports such as trees, walls and fences are used in backyard production. For large scale production 25-40 kg/ha of seed are needed.

Production: Green seeds/pods are produced in 3-4 months and mature seeds in 5-10 months. Seed yields of 700-900 kg/ha are possible. Green pods are hand picked when 10-15 cm long before they swell and become fibrous.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	15.0	1335	27.1	-	-	-	-
pod (fresh)	89.0	142	2.8	-	-	-	-

Legumes

Common name: Common bean
Local:

Scientific name: *Phaseolus vulgaris*
Plant family: FABACEAE

Description: There are many bush and climbing varieties of this bean. Climbing forms can be 2-3 m tall. Bush types are 20-60 cm tall. The leaves have three leaflets, one after another along the stem. The leaf stalk has a groove on the top. The side leaflets are unequal in shape, and can be 8-15 cm by 5-10 cm. The flowers are in the axils of leaves (where the leaves join the stem) and occur in a loose form. Flowers are white to purple. Pods are smooth, slender and 8-20 cm long by 1-1.5 cm wide. They are straight or slightly curved with a beak at the end and often have 10-12 coloured, kidney-shaped and seeds.

Distribution: It is a temperate plant that grows in many temperate and subtropical countries, including Solomon Islands. It mostly grows from 700-2000 m altitude in the tropics. It suffers from pest and disease damage in the lowlands, but can be grown to sea level. It is not suited to the wet tropics. It is shallow-rooted and damaged by excess moisture near the roots. A crop lifecycle needs about 350 mm of water. It is sensitive to frost and high temperatures. Flowers will not form below 9.5°C. Night temperatures above 37°C cause flowers to drop. The best temperature range is 15-21°C. It does not suit very acid soils. It suits hardiness zones 8-11.

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

Cultivation: Plants are grown from seed, preferably sown in raised beds. Seeds remain viable for 2 years. Germination is normally good if seed has been well stored. Climbing types need stakes. Plants are self-fertilised. These beans are intercropped with other plants in many places. 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 the pods are mature and turning yellow, the whole plants are pulled, then dried and threshed. About 50-75 kg of seed will sow a hectare. Flowering in most French bean varieties is not affected by day length.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (dry)	10.0	1386	25.0	10	1	8.0	2.8
seed (young)	92.0	142	3.0	-	20	0.8	0.2
pod	88.0	151	2.5	750	27	1.4	0.2
sprout	90.7	121	4.2	-	38.7	0.8	0.4

Legumes

Common name: Strap wattle
Local:

Scientific name: *Acacia holosericea*
Plant family: FABACEAE

Description: A shrub or small tree. It grows 5 m tall. There are prickles along the stem. The leaves are twice divided and there are 8-18 pairs of pinnae. There are up to 50 pairs of pinnules on each pinnae. The flowers are yellow. They are in large clusters at the ends of branches. The pods are flattened.

Distribution: It is a tropical plant. It grows in Australia in the Kimberleys in Western Australia and also in Queensland. It is often along the edges of streams. It is a tropical plant but adapts to sub-tropical places. It is damaged by drought and frost. It often starts the re-growth when an area is cleared. It needs a sunny position. It grows in areas with annual rainfall of 230-2250 mm. It usually grows below 300 m above sea level. It grows in areas with annual average temperatures between 20°-29°C. It can grow in arid places.

Use: The seeds are eaten. The seeds are ground into flour then cooked as flat bread. The roots of young plants are roasted and eaten. The clear gum can also be eaten.

Cultivation: It is grown from seed. The seed needs treatment to break the hard seed coat. Normally this is by putting the seeds in very hot water and letting the water cool down overnight then planting the seeds immediately. Plants can be pruned to control the straggly growth. To avoid fungal growth on the leaves, spacing and placement should be arranged to allow ample air movement.

Production: It is a fast-growing plant. Plants flower in winter and produce pods in winter and spring. Plants may only last 5-6 years. Seeds are separated from the pods by winnowing in the wind.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	6.6	1398	24.6	-	-	8.5	4.0

Image sourced from: Acacia holosericea 090626-5468 | North Coast Regional Botani... | Flickr

Fruit

Common name: Bush berry
Local:

Scientific name: *Maesobotrya barteri*
Plant family: PHYLLANTHACEAE

Description: A shrub or small tree that grows to 10 m high. The trunk is crooked. It produces its flowers and fruit along the trunk. The edible fruit are succulent and black/purple. They are oval and 1 cm long.

Distribution: A tropical plant. It is an under-storey plant of the high rain-forest.

Use: The fruit is eaten and used to flavour sauces and other dishes. They are also used for jams and jellies. The fruit stain the tongue.

Cultivation:

Production: In Liberia the fruit are produced from November to January.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	6.7	-	11.4	6.2	361	8.5	-
seed	3.9	-	13.3	12.6	22.3	4.9	-

Image sourced from: http://cfile1.uf.tistory.com/image/231ABD4854082D7207D894

Fruit

Common name: Guava
Local:

Scientific name: *Psidium guajava*
Plant family: MYRTACEAE

Description: A small evergreen tree 8-10 m tall with smooth, mottled bark which peels off in flakes. It is shallow rooted and branches close to the ground. The branches are four-angled. The leaves are opposite, dull green, and somewhat hairy. They are oval and somewhat pointed at both ends, 15 cm long by 2-5 cm wide with short leaf stalks. The showy flowers are white and borne in loose, irregular arrangements of 1-3 flowers that grow in the axils of leaves on new growth. The petals are 1.5-2 cm long. Both self and cross-pollination occurs. The fruit are rounded and 4-5 cm long. They are green, turning yellow when ripe. The skin is firm and encloses a pink, or nearly white, sweet-smelling, edible pulp with many seeds. In better selected varieties, the skin and the seeds are fully edible. Fruit vary from very acid to very sweet.

Distribution: A native to Central and South America, it grows in most tropical countries. Guava thrives in humid and dry tropical climates and does best in sunny positions. It is killed by frost and fruits better where there is a cooler season. Temperatures near 30°C are best. It grows in open areas and secondary forests and can become weedy in some conditions. It prefers a well-drained soil with good organic matter but can stand brief water-logging. A soil pH of 5-7 is best but can tolerate a pH from 4.6-8.9. Trees cannot tolerate salty conditions. It suits hardiness zones 9-12.

Use: The fruit are eaten raw and can be used for jams and jellies. Half-ripe fruit are added to help the jelly set. The young leaves are eaten raw or cooked. It is an attractive and nutritious fruit.

Cultivation: They are mostly grown from seed but seedling trees vary in quality. Seeds remain viable for a year or longer, and usually germinate in 2-3 weeks, but can take 8 weeks. Trees can be propagated by budding or grafting, and by layering, root cuttings or stem cuttings if hormones are used. Tips are used for stem cuttings and grown under mist at 28-30°C with bottom heat. Suckers can be used. Vegetative propagation preserves better fruit types. Trees self-sow in the lowland tropics. As fruit are produced on new season's growth, pruning does not greatly affect fruiting. Trees should be managed to give the maximum number of vigorous, new shoots and can be pruned for shape. Trees can be grown at 2.5 m within rows and 6 m apart between rows.

Production: Seedling trees begin to bear 2-3 years after transplanting. Pruning back the tips slightly increases fruit production. Tree-ripened fruit taste best. Ripening after picking can be hastened by placing them in a brown paper bag with a banana or apple. Mature fruit which have not changed colour can be stored 2-5 weeks at temperatures of 8-10°C and relative humidity of 85-95%. Mature fruit ripen in 2-3 days at normal temperatures and will keep for 7 days.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	77.1	238	1.1	60	184	1.4	0.2

Fruit

Common name: Small-leaved white raisin
Local:

Scientific name: *Grewia tenax*
Plant family: MALVACEAE

Description: A shrub that grows up to 2 m tall. It often lies along the ground. The leaves are small and nearly round. They are 5 cm long. They have 5 main veins. The tip of the leaf is pointed and the edge has teeth. The lower leaf surface has hairs. The flowers are white and occur singly. They are 2 cm across. They are on long slender branches. The fruit are orange-red, smooth and edible. They have 1-4 lobes. They are the size of a small maize grain.

Distribution: A tropical plant that grows in arid zones. It occurs in very dry woodland and semi-desert scrub. It grows on rocky and gravely soils. It grows in the Sahel. It is often near temporary pools. It grows in areas with over 200 mm rainfall. It can tolerate salt. In East Africa it grows between sea level and 1500 m altitude.

Use: The fruit are eaten fresh and raw. They are also dried for eating later. They are added to grains in porridge. A drink is made by soaking the fruit overnight then pressing, sieving and sweetening the juice. The seeds are edible.

Cultivation: Plants can be grown from seeds.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit (dry)	9.2	1157	5.5	-	-	-	-
fruit	59.1	-	4.5	-	161	125	-

Image accessed from:
http://www.southernafricanplants.net/photocollection/batch005/medium/G/TILLIACEAE_Grewia_tenax_Arandis_20090215_072_(1).jpg

Fruit

Common name: Mandarin
Local:

Scientific name: *Citrus reticulata*
Plant family: RUTACEAE

Description: A small, evergreen tree that grows 4-8 m tall and 2 m across. The stem is erect, branching and thorny. The leaves are dark green, and long and narrow in shape. They are 3-4 cm long. There is only a narrow wing on the leaf stalk. It has a few or no spines. The flowers are white and star-shaped. They are 2.5-4 cm across and have a scent. Fruit are almost round and the skin peels off easily. The fruit are 4-8 cm long. The flesh is red, juicy and sweet.

Distribution: It is grown in many tropical countries. It is the hardiest of the citrus. It grows from sea level up to 2300 m altitude in the tropics. It does best between 800 m and 1200 m altitude. A well-drained soil is needed. It also prefers a drier climate. It is drought and frost resistant. It needs a temperature above 3-5°C. It suits hardiness zones 9-11.

Use: The fruit are eaten fresh.

Cultivation: Trees are often grown from seed. Some breed true from seed. Seedling trees take a long time to start producing fruit. Budded trees are best. A spacing of about 8 m between trees is suitable. Several seedlings can grow from one seed. Using seedlings of seeds with three or more shoots helps produce trees true to type. Cuttings or layering can also be used.

Production: Fruit tend to be produced seasonally. The season is often from April to August in the southern hemisphere.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	87.6	184	1.5	42	136	0.8	-

Fruit

Common name: Lemon
Local:

Scientific name: *Citrus limon*
Plant family: RUTACEAE

Description: A small, evergreen tree with short spines. It grows to 7 m tall and spreads to 3 m across. It branches freely. Young branches are often reddish. Leaves are about 5-12 cm long. They are green and drawn out to a point with notched edges. The leaf stalk is usually not winged. The leaves do not have much of a scent. The flowers are white, with 5 petals and have a strong sweet smell. They are 4-5 cm across. The fruit is oval-shaped with a knob at the end. Fruit can be 7-15 cm long. The skin is fairly thin, rough and light yellow. The flesh is sour and the seeds are oval.

Distribution: It is grown in many Mediterranean climates and subtropical countries, and also in tropical regions. It does not do well on the coast in the tropics, but will grow well at about 1300 m. It prefers a light to medium, well-drained soil. It is drought-resistant, but most varieties are frost tender. It needs a temperature above 3-5°C for growth. It suits warm temperate regions. It suits hardiness zones 9-11.

Use: The fruit is mostly too sour to eat fresh, but the juice is used to make drinks. The peel is candied.

Cultivation: Many trees are seedlings. Better trees are grafted.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	83.3	65	1.1	-	80	0.4	0.1
juice	91.3	31	0.3	-	50	0.1	-

Fruit

Common name: Pawpaw
Local:

Scientific name: *Carica papaya*
Plant family: CARICACEAE

Description: Pawpaw is a tropical fruit that grows 3-5 m tall and only occasionally has branches. The stem is softly woody with scars from fallen leaves along it. There is a clump of leaves at the top of the plant. The leaves are large (50 cm wide) deeply lobed and on leaf stalks up to 90 cm long. Trees can be male, female or bisexual. Male flowers are small and white and on long stalks. Female and bisexual flowers are on short stalks. These have no fruit, round fruit and long fruit respectively. There are three forms of long fruit. The seeds are black.

Distribution: It is a tropical plant that grows from sea level up to about 1700 m altitude in the equatorial tropics. In cooler regions they have to be planted but in humid tropical regions are commonly self-sown. Sunlight allows germination when forest is cleared. It cannot stand frost. It needs a night temperature above 12°C and won't tolerate water-logging. Plants die after 48 hours in standing water. It needs a pH between 5-8 and suits hardiness zones 11-12.

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. Papayas contain papain which is a meat tenderiser. The dried seeds can be used as a spice.

Cultivation: Pawpaw seeds grow easily and plants grow quickly. Fresh seeds can be used. If dry seeds are used they should be soaked before planting. Seeds should be sown when temperatures are 24-30°C. They need a reasonably fertile soil. Seeds can be sown directly or put in a nursery and the seedlings transplanted. Seeds in a nursery should be sown 1-2 cm deep. Seedlings can be transplanted when they are about 20 cm high. Plants should be about 3 m apart. Continuous fruit production depends on fertility, temperature and moisture being adequate to maintain active growth. The fruit is produced year round but the growth and development rate decreases with temperature. The size and quality of fruit declines at lower temperatures. Pollination is by wind and insects and is not normally limiting. Normally cross and self-pollination both occur. Seeds are dispersed by birds, bats and people and remain viable for a few months.

Production: Seeds emerge in 2-3 weeks. Vegetative growth before flowering is 4-8 months. One or more fruit grow per leaf axil, about every 1-2 weeks under good growing conditions. With good growth, 100 fruit can be produced from one plant in a year. Pollination to maturity is about 2-3 months. On the coast in tropical equatorial regions, pawpaws start producing fruit after about 4-5 months, but in the highlands this may take 12-18 months. The first fruit are ready 6-11 months from planting. Tree life is about 2-3 years, although they may live for 10-12 years.

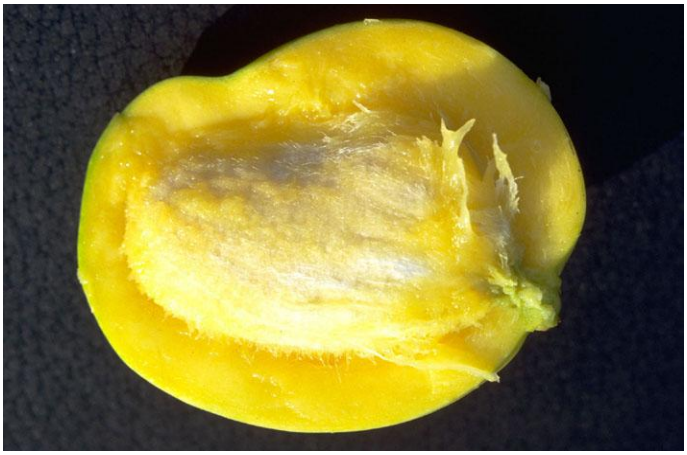
Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	75.4	378	8.0	-	140	0.77	-
fruit	88.0	163	0.5	290	54	0.4	0.18
fruit (unripe)	92.1	109	1.0	-	-	0.3	-

Fruit

Common name: Mango
Local:

Scientific name: *Mangifera indica*
Plant family: ANACARDIACEAE



Description: An erect, branched evergreen tree. It can grow to 10-40 m high and is long lived. (Trees grown by vegetative means are smaller and more compact.) Trees spread to 15 m across. It has strong deep roots. The trunk is thick. The bark is greyish-brown. The leaves are simple and shaped like a spear. Some kinds of mangoes have leaves with a wavy edge. They can be 10-30 cm long and 2-10 cm wide. They are arranged in spirals. The leaf stalk is 1-10 cm long and flattened. Leaves are often brightly coloured and brownish-red when young. These tender leaves which are produced in flushes become stiff and dark-green when mature. The flower stalks are at the ends of branches. They are 10-50 cm long and branching. Up to 6000 flowers can occur on a stalk. Most of these are male and up to 35% have both male and female flower parts. Fruit are green, yellow or red and 2.5-30 cm long. The fruit hang down on long stalks. The outside layer of the seed is hard and fibrous and there is one seed inside. Several embryos can develop from one seed by asexual reproduction. The fruit shape and colour vary as well as the amount of fibre and the flavour. India has many varieties and they cannot tolerate humidity.

Distribution: A tropical and subtropical plant. It grows in the lowlands. It grows from sea level up to 1300 m altitude in the tropics. It does best in areas below 700 m and with a dry season. Rain and high humidity at flowering reduces fruit set. It thrives best where temperatures are about 25°C but will grow with temperatures from 10-42°C. Temperatures of 0°C will damage young trees and flowers. Low temperatures (10-20°C) at flowering time will reduce fruiting. As temperatures get lower due to latitude or altitude, fruit maturity is later and trees become more likely to only have good crops every second year. Mangoes can grow on a range of soils. In wetter areas soils with less clay are better. They can withstand occasional flooding. A soil pH of 5.5-6.5 is best. Soils with pH above 7.5 cause plants to develop iron deficiency. It grows in the Sahel. It can grow in arid places. It suits hardiness zones 11-12.

Use: Ripe fruit are eaten raw. Unripe fruit is pickled. Seeds can be eaten cooked. They are boiled or roasted. They are made into meal by powdering. Young leaves can be eaten raw or cooked. Amchur is made from the dried unripe fruit. This is used in curries, and pickles and chutneys. The seed kernels are used for famine food in India. They are boiled, roasted or soaked to remove the bitterness. **Caution:** The sap from the tree or fruit can cause skin problems with some people.

Cultivation: Trees are grown by planting fresh seed and they can be transplanted. Mangoes vary in their ability to breed true from seed. When more than one seedling emerges from the seed some of these are asexual and breed true. Clean seed germinate best if they are treated at 50°C for 20 minutes, then planted on their edge with the round bulge upwards and near the soil surface. The husk around the seed should be removed. Seeds germinate in 3-6 weeks. The strongest growing seedlings from this seed are used and the others thrown away. The seedlings from the folds of the seed are vegetative while the seedling from the centre of the seedling near the stalk end may be sexual and show variation from type. Other seeds only produce one seedling and these normally

vary and can be different from the parent tree. Plants can be propagated by budding, or by grafting using in-arching. This is not easy and care is required. In wetter places, flowers need to be protected with fungicides to enable fruit to form. If organic manure is used this should not be directly in the planting hole nor immediately against the new plant. Young transplanted seedlings need regular watering. A spacing of 6-12 m between plants is used. Wind protection is advisable to prevent fruit rubbing and getting damaged. Trees should only ever be lightly pruned as fruit develop on new growth and heavy pruning can reduce flowering. Flowering can be brought about by foliar sprays of potassium nitrate.

Production: Seeds germinate after about 20 days. Seedling trees produce after 4-6 years and increase in production up to 20 years. Trees often bear better each second year. Rain at flowering reduces fruit setting. Fruiting is at the end of the year. Fruit take 4-5 months to mature. Fruit vary in weight from 200-1000 g. Trees can produce one million flowers but only 500 fruit. Trees last for many years.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	83.0	253	0.5	180	30	0.5	0.04
leaf	82.1	226	3.9	-	60	2.8	-

Fruit

Common name: Cape gooseberry
Local:

Scientific name: *Physalis peruviana*
Plant family: SOLANACEAE

Description: A perennial herb that grows 45-90 cm tall. They are often grown as annuals. It is hairy and slightly branched. The spreading branches are purplish and ribbed. The leaf blade is 6-15 cm long by 4-10 cm wide. The leaves are heart shaped at the base and taper to the tip. They are slightly wavy and toothed along the edge. The flowers occur singly and hang down in the axils of leaves. The flowers are white with violet anthers and slightly spotted petals. The fruit is a berry 1-1.5 cm across. They are orange-yellow or pale brown. This is inside an inflated husk. The seeds are yellow and 2 mm across. There are several named cultivated varieties.

Distribution: A temperate plant that grows in the tropical highlands. It suits warm climates and does best in warm sunny conditions. It needs well drained soil. Plants are not killed by a slight frost but it grows best free from severe frosts and strong winds. In Indonesia plants are found from 700-2300 m altitude, but fruit best above 1500 m. It can grow in arid places and suits hardiness zones 8-10.

Use: The ripe fruit are eaten fresh or cooked. They are used for jam. They can be dried, preserved, stewed, pureed, or used in pies, cakes, jellies and sauces. Roasted seeds are pickled. The leaves have been used instead of hops in beer. The leaves are also used as a potherb.

Cultivation: Plants are grown from seed that is broadcast over the soil. Seeds should be sown 1.5 cm deep in loose soil. Seed germinate irregularly. Plants should be spaced 45 cm apart. In the tropics, plants keep growing from year to year, but in the subtropics they regrow from seed each year. Plants can be grown from softwood cuttings from the upper parts of the shoots. Seedlings can be transplanted.

Production: Plants produce fruit in 1 year.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit (mature)	84.2	201	2.0	360	30	1.5	-

Fruit

Common name: Cantaloupe
Local:

Scientific name: *Cucumis melo*
Plant family: CUCURBITACEAE

Description: A pumpkin family plant. It is an annual climber with tendrils. It grows to 0.5 m high and spreads to 1.5 m across. The stems are soft and hairy and often angled. The leaves have lobes and often a wavy or toothed edge. They are on long leaf stalks. The leaves are often hairy underneath. The tendrils are not branched. The flowers are yellow and funnel shaped with expanded lobes. The male flowers occur in clusters and are produced before the female flowers. The fruit is round, mostly with a rough or streaky skin. It is green or yellow inside. The fruit is edible. Different kinds of melons occur. Some have a hard, warty, scaly skin. Others have a network of fine ridges over the surface.

Distribution: A tropical plant, but not suited to places with high rainfall. It suits hot dry places with a fertile well drained soil. It needs a sheltered sunny position. It is drought and frost tender. A temperature range of 24-28°C is best but much higher temperatures are tolerated. Mostly they are grown below 500 m altitude in the tropics. A pH of 6-6.7 is best. Acid soils are not suitable. It can grow in arid places. It suits hardiness zones 9-12.

Use: The ripe fruit are eaten raw. They are also dried, candied and made into jams, jellies and preserves. The seeds are sometimes eaten roasted. The seeds are blended with fruit juice to form a drink. Sometimes the immature fruit are cooked as a vegetable. The seeds contain an edible light oil. The young leaves are eaten as a potherb.

Cultivation: They are grown from seed planted about 1-4 cm deep. Plants need to be 1-2 m apart. Seedlings can be transplanted when about 10-15 cm high.

Production: Plants are ready 3-4 months after planting. Yields of 20 kg per10 sq m is average.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	7.0	2319	15.8	-	-	-	-
leaf	85.0	172	4.2	72	-	-	-
fruit	93.0	109	0.5	300	30	0.4	0.2

Fruit

Common name: Avocado
Local:

Scientific name: *Persea americana*
Plant family: LAURACEAE

Description: A small to medium sized tree that normally grows 8-10 m tall, but can reach 25 m. The leaf stalk is 1.5-5 cm long. Leaves are entire, oval and 5-40 cm long. Flowers are greenish, small and on the ends of branches. Clusters of flowers may contain 200-300 flowers. Normally only 1-3 fruit develop from each cluster. The fruit is round or pear shaped, and 7-20 cm long. The fruit are greenish-yellow with some red coloration. The fruit has greenish-yellow flesh and a large round seed. There are 3 named races-West Indian, Guatemalan and Mexican.

Distribution: A subtropical plant that grows from sea level up to 2250 m in the tropics. It cannot stand water-logging. Branches are easily damaged by wind. It needs a frost free location or where frosts are rare. West Indian varieties thrive in humid, tropical climates, freeze at or near 0°C and can stand some salinity. Mexican types come from dry subtropical plateaus and thrive in a Mediterranean climate. They are hardy to -7° C. They are salt sensitive, have the smallest fruits and the thinnest skin. The best daytime temperature is 25-33°C. Guatemalan types come from cool, high-altitude tropics and are hardy to -3° C. It does best with neutral or slightly acid and well aerated soil. Growth is disrupted when soil temperature is below 13°C. It needs high humidity at flowering and fruit set. It can grow in arid places.

Use: The fruit pulp is eaten raw or cooked. It is used in salads, soups, sandwiches, spreads, ice cream, tortillas and wine. The fruit is mixed with sugar and water to make a drink. Oil is extracted from the flesh and is used in salad dressing. The leaves can be used for tea sweetened with sugarcane juice. Toasted leaves are used to season stews and bean dishes.

Cultivation: Plants are often grown from seed. Seeds remain viable for 2-3 weeks. Fresh seed held at 25°C day to 15°C night will germinate in 3 weeks. It is best to propagate vegetatively. Tip cuttings, layers and grafts can be used. Because different types have pollen at different times of day, a mixture of trees which have pollen and flowers receptive at different times gives best fruit set. Although trees will grow in shade, they need sun for fruiting. The leaves do not rot easily and can accumulate under trees. Other plants cannot be grown under avocado trees.

Production: Seedlings grow quickly and continuously in warm, moist conditions. Seedlings bear after 5-8 years. Grafted trees can fruit in 1-2 years. A good tree produces 400-600 fruit each year. A fruit can weigh 50 g-1 kg. In the subtropics, trees often produce 2 main flushes of fruit per year. From fruit set to maturity can take 6-12 months. Fruit ripen off the tree in 4-14 days. For the Mexican types, the fruit weigh less than 250 g and they ripen 6-8 months after flowering.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	74.4	805	1.8	480	11	0.7	0.4

Image sourced from:
https://upload.wikimedia.org/wikipedia/commons/7/7d/Avocados_(Persea_americana)_(18159574242).jpg

Vegetables

Common name: Bird's eye chillies
Local:

Scientific name: *Capsicum frutescens*
Plant family: SOLANACEAE

Description: It is a shrubby, perennial plant growing about 1 m tall. The leaves are smaller than round capsicums or bell peppers. Two or more flowers occur together in the axils of leaves. They have small pointed fruit about 1-2 cm long and they are red when ripe. They have a very hot taste when eaten or touched on the lips.

Distribution: It is grown in most tropical countries. It grows from sea level up to about 1800 m altitude in the equatorial tropics. It can't tolerate water-logging or frost. It tolerates high temperatures and a wide range of rainfall. Very high rainfall leads to poor fruit set and rotting of fruit. Soil needs to be well-drained and, preferably, fertile with adequate organic material. Light, loamy soils rich in lime are best. It suits hardiness zones 10-12.

Use: The leaves are eaten for their mild, spicy taste. The leaves are eaten cooked. The fruit can be used in very small quantities to spice food. The small, red fruit are very hot to eat due to a chemical called capsaicin. They are used to add spice and flavour to other foods. It would not be appropriate to eat sufficient of Bird's eye chilli fruit to significantly affect nutrition.

Cultivation: The seeds are dried in the sun. They are small. For large-scale plantings, 1.8-2.3 kg/ha of seed is needed. Seed is best sown in nurseries and the seedlings transplanted when they have 4-5 leaves (after 3-4 weeks). They can be transplanted at about 0.8 m spacing. Pruning out the tops can increase branching. This is often done 10 days before transplanting. Excessive nitrogen can reduce fruit setting.

Production: The first picking of fruit can occur 3 months after planting and continue about every two weeks. Plants continue to be harvested for about 4-5 years before replanting. For dried chillies, the fruit are dried in the sun for 3-15 days. The fresh weight is reduced by about two thirds during drying. Yields of dry chillies can be from 300-2500 kg/ha depending on growing conditions, irrigation, etc.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	74.0	395	4.1	7140	121	2.9	-

Vegetables

Common name: Okra
Local:

Scientific name: *Abelmoschus esculentus*
Plant family: MALVACEAE

Description: A tropical annual herb that grows erect, often with hairy stems. It mostly grows about 1 m tall but can be 3.5 m tall. It becomes woody at the base. The leaves have long stalks up to 30 cm long. Leaves vary in shape but are roughly heart shaped with lobes and teeth along the edge. Upper leaves are more deeply divided than lower ones. The flowers are yellow with red hearts. The fruits are green, long and ribbed. The seeds are 4-5 mm across. They are round and dark green.

Distribution: A tropical plant that suits the hot humid tropical lowlands but is unsuited to the highlands. It is very sensitive to frost. It can grow in salty soils. It grows best where temperatures are 20-36°C. It can grow well in dry climates with irrigation. It suits hot humid environments. It does best on well drained well manured soils but will grow on many soils. A soil pH of 5.5-7.0 is best.

Use: Pods are eaten cooked. They are slimy, but less so if fried. Dried powdered seeds can be used in soups as a thickener. They can also be pickled. Young leaves can be eaten cooked. They can be dried and stored. Flowers can also be eaten. Okra is frozen and canned. The seeds are roasted and used as a coffee substitute.

Cultivation: They are grown from seeds, which 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. About 8-10 kg of seed are required for one hectare. Most kinds respond to fertiliser. Seeds do not breed true and can cross with other kinds of okra growing nearby. This is not normally a problem but simply means plants and fruit are not all the same.

Production: Plants maintain production if the fruits are harvested regularly. Plants are ready to harvest 8-10 weeks after sowing. Seed yields of 500-800 kg per hectare are recorded. Pod yields of 4-6 tonnes per hectare occur. It takes 2-4 months from sowing to harvest of young pods. Pods develop 5-10 days after flowering. Pod harvests can continue for 1-2 months. Leaving pods on the plants stops new pods developing.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	9.2	1721	23.7	-	-	-	-
leaf	81.0	235	4.4	116	59	0.7	-
pod (fresh)	88.0	151	2.1	185	47	1.2	-
fruit (cooked)	90.0	134	1.9	58	16.3	0.5	0.6
fruit (raw)	90.0	71	2.0	90	25	1.0	-

Vegetables

Common name: Sweet potato
Local:

Scientific name: *Ipomoea batatas*
Plant family: CONVOLVULACEAE

Description: This is a root crop which produces long creeping vines. The leaves are carried singly along the vine. Leaves can vary considerably from divided like fingers on a hand, to being entire and rounded or heart shaped. Purple trumpet shaped flowers grow at the end of the vine. Fattened roots are produced under the ground. There are a large number of varieties which vary in leaf shape and colour, root shape, colour, texture and in several other ways.

Distribution: A tropical and subtropical plant. They grow from sea level up to about 2700 m altitude in the tropics. Plants can grow with a wide range of rainfall patterns and in different soils. Plants are killed by frost and can't stand water-logging. Plants grow well with temperatures between 21-26°C. It can grow with a pH between 5.2-6.8. Sweet potato are not tolerant to shading. It suits hardiness zones 9-12.

Use: Roots are boiled or baked. They can be steamed, fried, mashed or dried. They can be fermented into alcoholic drinks. They can also be used in pies, cakes, puddings and candies and jams. They can be used in noodles. The chopped and dried roots can be boiled with rice or ground into flour and mixed with wheat flour to make cakes or bread. The young leaves are edible.

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. Enlarged roots won't form if the ground is waterlogged when the plant roots start to develop. Sweet potato is grown by cuttings of the vine. About 33000 cuttings are required per hectare. These weigh about 500 kg. Vine lengths of about 30 cm are optimum. As long as the vine is adequately inserted in the soil, the length of vine inserted does not significantly affect yield. Fresh sweet potato seeds germinate relatively easily and lead to continuous production of new cultivars under tropical conditions. Excess nitrogen restricts storage root initiation and therefore excess leaves are produced without significant root yield. Dry matter percentage increases with increasing age of the crop. Higher dry matter roots are normally preferred.

Sweet potatoes are not tolerant to shading. Under shaded conditions, both foliage growth and storage root production are decreased. Some cultivars can be selected for increased production under mild shade but not heavy shade. The survival of cuttings at planting is also reduced under shaded conditions. Under shaded conditions, plant become more climbing and with fewer, larger leaves. With increasing shade, fewer roots are produced and these grow more slowly. Sweet potato tends to be responsive to potassium fertiliser. Cultivars are often selected for yield under low fertility conditions.

Under lowland conditions in the tropics sweet potato roots undergo active enlargement from 6-16 weeks. Weed control is essential especially during early stages of growth. The rate of ground coverage by foliage varies greatly with growing conditions and cultivar, but once ground coverage has occurred, weed control is less of a problem. Initiation of root enlargement is subject to aeration

in the soil. Either heavy clay soils, waterlogged conditions or other factors reducing aeration can result in poor root production. For this reason, sweet potatoes are often grown on mounded beds. In well drained or high organic matter soils, digging or mounding is not as essential. Leaf scab (*Elsinoe batatas*) can significantly reduce yield especially in sites where leaf production is low due to low soil fertility. To reduce sweet potato weevil damage, plants need to be hilled or have the roots well covered with soil. Cracking soils can allow the weevil access to roots.

Production: The time to maturity ranges from 5 months to 12 months depending on the variety planted and the altitude at which it is being grown. Yields range from 6-23 t/ha.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
root (baked)	72.9	431	1.7	2182	24.6	0.5	0.3
root (raw)	70.0	387	1.2	4000	25	0.7	0.4
root (boiled)	72.0	363	1.1	1705	15	0.6	0.3
leaf	86.3	168	3.9	105	58	2.9	-

Vegetables

Common name: Carrot
Local:

Scientific name: *Daucus carota* subsp. *sativus*
Plant family: APIACEAE

Description: A root crop grown from seed. It normally grows a fattened root one year then forms a flower the next year. It can be 60 cm high and spread to 50 cm wide. The root is long in shape and orange in colour. The stem is erect, tough and furrowed. The leaves are feathery and divided 3 times. The leaves have a sheath clasping the stalk at the base. The flowers are white and lacy. They form a dense compound cluster at the top of the plant. Sometimes flowers are only produced into the second year of growth, depending on temperature.

Distribution: A temperate plant. In the tropics it is mostly grown in the highlands, but will grow from sea level to 2600 m altitude. Sometimes on the coast only leaves are produced. Carrots are frost resistant. In Nepal carrots are grown up to 1700 m altitude. It needs a deep loose soil. Seed germinate well in the temperature range 7-24°C. Plants grow well with a temperature about 15°C. It grows best with a pH of 6-7. It suits hardiness zones 3-9.

Use: Both the roots and the leaves are edible. The young leaves are used in soups. The roots can be eaten raw or cooked. They can be steamed, fried, pickled, made into jam, or used in stews. Carrot seed oil is used as a flavouring. The juice is used raw and fermented. The roots can be dried and the flour used to flavour and thicken soups.

Cultivation: They are grown from seeds sown directly. Because the seeds are very small, they are sometimes mixed with sand before sowing to allow a more even distribution of plants. A spacing 5 cm apart in rows 15-20 cm apart is suitable. Often this spacing is achieved by thinning out plants. For seed production, a low temperature of 4-9°C for 40-60 days is needed before flowering to break the dormancy.

Production: There are tropical varieties that mature within 90-110 days.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
root (raw)	89.9	180	1.0	2813	6	0.6	0.4
root (boiled)	91.5	79	0.6	2455	4	0.4	0.3
leaf	87.4	-	2.2	65	-	-	-

Vegetables

Common name: Silver spinach
Local:

Scientific name: *Celosia trigyna*
Plant family: AMARANTHACEAE

Description: A branched and straggling herb that grows 25-120 cm tall. The lower leaves have long leaf stalks. The plant looks like *Amaranthus hybridus* until it starts to flower. Where the leaf stalk joins the stem there is a pair of small moon-shaped leaflets that lie around the stem. The small white or silvery flowers are crowded together in separate clusters. The fruit is a capsule which is almost round and has several seeds.

Distribution: A tropical plant that grows in tropical lowlands and highlands in Africa. It is often along the coast but grows from sea level to 1960 m above sea level. It needs an annual rainfall of up to 2500 mm and an average temperature of 25-30°C. It cannot tolerate a temperature below 15°C. It grows best on fertile, well drained soils.

Use: The young shoots and leaves are cooked and eaten. They are finely cut and used in soups, stews and sauces. Because they can be bitter, they need extensive cooking or mixing with other foods.

Cultivation: Plants are grown from seeds which germinate in 4-5 days. It grows for 90-120 days. Because the seeds are small, they are best mixed with sand to give a more even distribution when sowing.

Production: Plants can be uprooted and harvested or leaves removed. Harvests of 4-5 t/ha can be achieved from weekly harvests over 2 months.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	89.0	139	2.7	94	10	5.0	-

Image accessed from http://www.flickr.com/photos/36517976@N06/5063937939

Vegetables

Common name: Moringa
Local:

Scientific name: *Moringa oleifera*
Plant family: MORINGACEAE

Description: A small, soft-wooded tree that grows 9-12 m tall. The tree loses its leaves during the year. The bark is grey, thick, corky and peels off in patches. The leaves are pale green and the leaf is divided 3 times. The whole leaf is 30-60 cm long and the leaflets are usually oval and 1-2 cm long. The leaflets are jointed with a gland near the joint. The flowers are pale yellow. They occur in long sprays 30 cm long. Each flower has 5 petals and of these one is erect and 4 are bent backwards. The fruit is a long capsule 30-100 cm long by 2 cm wide. The seed capsules are up to 45 cm long. They are roughly triangular in shape. The seeds have 3 wings. Often the fruiting kinds are grown as annual plants.

Distribution: A tropical and subtropical plant. They suit the dry lowland areas and grow up to 1350 m altitude in the tropics. They are not hardy to frost. They cannot tolerate water-logging. A pH of 6-7.5 is suitable. It can grow in arid places. It suits hardiness zones 9-12.

Use: The young tops and leaves are eaten cooked. They are eaten as potherbs or used in soups and curries. They can be dried and stored for later use. The very young long pods are eaten cooked, especially in curries and soup. They are also pickled. The young seeds are eaten roasted or fried. Sometimes the roots are used as a horseradish substitute. A gum from the bark is used as seasoning. The bark is used for tea. The roots, leaves, flowers and fruits are eaten cooked in water and mixed with salt and chili peppers. The oil expressed from the seeds is used in salads.

Cultivation: It is best to grow plants from 1 m long cuttings but they can be grown from seed. They can be used as a hedge and pruned regularly to produce more leaves. Properly dried seed can be stored for a long time in sealed containers in a cool place. Normally perennial types are grown from cuttings and annual types are grown from seed.

Production: Trees are fast growing. They can be pruned or topped. With one variety the tree flowers and fruits continuously while with the other variety there are flowers and fruit once per year. The fruit ripens 3 months after flowering. Annual types produce fruit 6 months after planting. Leaves are best dried in the shade to retain more of their Vitamin A.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	76.4	302	5.0	197	165	3.6	-
flower	84.2	205	3.3	-	-	5.2	-
leaf (boiled)	87	189	4.7	883	31.0	2.0	0.2
pod (raw)	88.2	155	2.1	7	141	0.4	0.5
seed	6.5	-	46.6	-	-	-	-

Vegetables

Common name: Peanut
Local:

Scientific name: *Arachis hypogaea*
Plant family: FABACEAE

Description: Peanuts grow on spreading bushy plants up to about 40 cm high. The leaves are made up of 2 pairs of oppositely arranged leaflets. Flowers are produced in the axils of the leaves. Two main kinds of peanuts occur. The runner kind (Virginia peanut) has a vegetative or leafy branch between each fruiting branch and therefore produces a spreading bush. The bunch type (Spanish-Valencia peanuts) produces fruiting branches in a sequence one after the other along the branches. They grow as a more upright plant and grow more quickly. Pods are produced on long stalks which extend underground and they contain between 2-6 seeds. The stalk or peg from the flower grows down into the soil and then produces the pod and seed under the ground. The flowers need to be no more than 18 cm from the soil surface for the seed pod to develop underground.

Distribution: Peanuts grow in tropical and subtropical areas. They grow well from sea level up to about 1650 metres in the equatorial tropics. They require temperatures of 24-33°C. Plants are killed by frost. They need a well-drained soil and cannot stand water-logging and often require raised garden beds. Peanuts need 300-500 mm of rain during the growing season. Dry weather is needed near harvest.

Use: The seeds can be eaten raw, cooked or sprouted. They are boiled, steamed, roasted, salted or made into peanut butter or flour. The young leaves and unripe pods are edible after cooking. An edible oil is extracted from the seeds. The remaining meal can also be eaten.

Cultivation: Peanuts require soil with good levels of calcium and boron or they produce empty pods. Peanuts have nitrogen fixing root nodule bacteria and therefore can give good yields in soils where nitrogen is low. The nuts are normally removed from the shell before planting and are sown 2-3 cm deep, with 10 cm between plants and 60-80 cm between rows. The soil needs to be weeded and loose by the time the flowers are produced to allow the peg for the seed pods to penetrate the soil.

Production: Flowering can commence in 30 days and it takes 3.5-5 months until maturity. Peanuts are harvested by pulling out the plant when the top of the plants die down. After harvesting, they should be left to dry in the sun for 3-4 days. Virginia peanuts have a longer growing season and the seeds need to be stored for 30 days before they will start to re-grow.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (dry)	4.5	2364	24.3	0	-	2.0	3.0
seed (fresh)	45	1394	15	-	10	1.5	-
leaf	78.5	228	4.4	-	-	4.2	-

Vegetables

Common name: African locust bean
Local:

Scientific name: *Parkia filicoidea*
Plant family: FABACEAE

Description: A deciduous tree that grows up to 35 m tall. It has a spreading flat crown. The trunk has small, rounded buttresses. The grey to yellow-brown bark can be scaly or smooth, and becomes dark and cracked with age. The bark has an orange-coloured resin. The leaves are feathery. A leaf is made up of 6-9 pairs of leaflets each divided into 16-24 pairs of smaller leaflets. These are about 2 cm long and 5-8 mm wide. The flowers are small and in bright red club shaped heads. These hang down on stalks 30 cm long. The flower heads are up to 8 cm long. The fruit are dark brown to purple pods which hang down in clusters. They are 30-60 cm long and 2 cm wide with their stalk. The pod is narrowed slightly between the seeds. The seeds are red-brown in a dry, mealy, edible, yellow pulp.

Distribution: A tropical and subtropical tree of lowland rainforests. It grows in Africa in forests near streams. It occurs in sub-humid and humid places with an annual rainfall of 950-1750 mm annually. It grows from 250-1370 m above sea level. It can grow in arid places.

Use: The pods and the pulp are eaten. The seeds are boiled and fermented then eaten. This has a strong smell but is removed by frying or roasting. The seeds can also be powdered and used for flavouring soups and rice dishes. The leaves are cooked and used as a vegetable.

Cultivation: Plants can be grown from seed. The pod is crushed and the seed removed from the pulp. The seed they should be boiled briefly, then allowed to cool and soaked for 12 hours, before sowing.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (dry)	7.0	1780	32.3	-	6	33.2	-
fruit	13.2	1263	3.4	-	-	3.6	-

Image accessed from:
http://www.westafricanplants.senckenberg.de/images/pictures/fabmimo_parkia_filicoidea_cbch_6118_4049_b8ed36.jpg

Vegetables

Common name: Nut grass
Local:

Scientific name: *Cyperus rotundus*
Plant family: CYPERACEAE

Description: A sedge. It is a herb that continues growing from year to year. It has both rhizomes and tubers under the ground. The leaves of this plant have a blunt tip and do not have a shoulder along the leaf. The leaves mostly grow from the base of the plant. They are narrow and flat and 5-20 cm long. The flower is a compound flower with 5 leafy bracts near the base of the flower. These are of different lengths. The flower stem is 3-angled and 20-50 cm high. The fruit are 3 angled and brown. They are about 1.5 mm long. The tubers of this species are dark brown, in a chain and have a bitter or unpleasant taste.

Distribution: A tropical plant. It occurs world-wide in warmer places. In Papua New Guinea it grows up to 1800 m altitude. In Nepal it grows between 300-2400 m altitude. It grows in moist places. It can grow in most soil types and most pH levels. It cannot tolerate salt or shade. It can grow in arid places.

Use: The tubers are eaten fresh. They are also roasted or boiled and can be dried and made into flour. The bases of the culms are cooked and eaten. **Caution:** All parts of the plant can contain poisonous cyanide (the bitter taste) so must be well heated before eating.

Cultivation: Plants are grown by seed or tuberous rhizomes. Seeds often do not grow. Rhizomes and tubers are more common methods of reproduction.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
bulb	53.3	750	1.9	-	2	5.8	1.4

Image sourced from: https://en.wikipedia.org/wiki/Cyperus_rotundus

Leafy greens

Common name: Grain amaranth
Local:

Scientific name: *Amaranthus caudatus*
Plant family: AMARANTHACEAE

Description: An annual plant which can be 2 m high and 45 cm across. The stems are angular and it can have a single stem or be branched. It is often limp in the upper parts. Plants are hairy at first but become smooth. Often they are tinged purple. Leaves are 2-4 cm long by 0.7-1.6 cm wide on a leaf stalk 0.5-1.5 cm long. Leaves can taper to a tip at the end. They can also thin towards the base. The veins are pale underneath. The flower clusters are in spikes on the side or top branches. The flowers are sometimes branched and can droop over. They can be 45 cm long. The fruit is oval. Seeds are 1-1.3 mm across.

Distribution: A tropical plant. It can grow in warm temperate places. It cannot tolerate frost. Plants do best under high light, warm conditions and dry conditions. They need a well-drained soil. Some varieties can tolerate pH up to 8.5 and there is some salt tolerance. It can grow in arid places. In the Andes it grows between 500-3000 m above sea level. It suits hardiness zones 8-11.

Use: The leaves and young plant are eaten cooked. They are also used in stir fries and added to soups. The seeds are ground into flour and used to make bread. **Caution:** This plant can accumulate nitrates if grown with high nitrogen inorganic fertilisers and these are poisonous.

Cultivation: Plants can be grown from seed if the soil is warm. Seeds are small and grow easily. Cuttings of growing plants root easily. Amaranths are mostly grown from seeds. The seeds are collected from a mature dry seed head of an old plant. These dry flower stalks are stored and then the flowers rubbed between the hands over the garden site. Collecting the seeds is fairly easy by banging flower heads on a mat or piece of cloth then the rubbish can be blown out of this mixture by dropping it and blowing gently as it falls. The very small seeds of these plants are scattered over the ashes or fine soil in fertile ground. Some types are self-sown.

Amaranthus seeds are very small. A thousand seeds weigh about 0.3 g. It is very difficult to sow such small seeds evenly over the ground. So there are a few different methods you can use to try and get the plants well-spaced. One way is to mix the seeds with some sand and then when you sprinkle this along a row it will only contain a few seeds among the sand. The other way is to throw the seeds over a small plot of ground which will be a nursery. After 2 or 3 weeks the seedlings can be transplanted into the garden bed where they are to grow. If the seeds are just scattered over the garden, the small seedlings can be thinned out and either eaten or transplanted to a different spot. Seedlings are transplanted when about 5-7 cm tall. Plants can be harvested when small by thinning out and either transplanted or eaten cooked. Plants can be harvested whole or have top leaves harvested several times. Harvesting begins after 4-7 weeks and can continue over 2 months.

A spacing of about 8 cm x 8 cm is used if the plants are to be harvested by pulling up the whole plant. If the harvesting is to be done by picking off the top leaves, a wider spacing is normally used.

When the tops are picked out 3 or 4 times over the life of the one plant, a spacing of about 30 cm x 30 cm is used.

As far as producing a large amount of food is concerned, the spacing is not very important. Having between 200 and 1000 plants per square metre gives about the same total amount of food. The main thing that varies is the size of the leaves. Mostly people like larger leaves so a wider spacing of 8 cm to 10 cm for plants to be pulled out is suitable. For plants to be harvested by picking out the tops, they can be picked down to about 15 cm high. Picking lower makes the plant flower later, but it also recovers more slowly from picking.

Amaranths grow quickly. Seedlings come up above the ground in 3-5 days. They are 5-7 cm high and big enough for transplanting after about 20 days. The plants can be pulled out and used after 6 weeks. If they are harvested by picking out the tops, this can be started at 5-7 weeks and continued 3-4 times over the next 2 months.

Amaranths eventually stop producing leaves and grow flowers. Flowering occurs after about 3 months and seed can be recollected about a month later. Amaranths are called day-length neutral plants because they still produce flowers at about the same stage, irrespective of whether there are many or few hours of daylight. Because flowering stops harvesting of leaves, it is a problem, but there does not seem to be any easy way of slowing down flowering. Flowering can be delayed a little by picking out the tops down to a lower level. Also it is made a little later if plants are grown in the shade. But lower picking and growing in the shade mean the plants produce less food, so there is no point. Plants need to be harvested and used when they are ready. If plants are left growing the amount of harvestable leaf gets less and the quality gets poorer.

Nitrogen deficiency shows as the oldest leaves near the bottom of the plant going yellow. This is because the plant needs more nitrogen to grow more new leaves at the top and there is not enough nitrogen in the soil for it to get it from there. So it reuses the nitrogen it used in the oldest leaves. These leaves therefore go yellow. Potassium deficiency shows as the edges of the oldest leaves going yellow. These shortages of nutrients could be corrected by adding some nitrogen or potash fertiliser but it is most likely too late for the current crop.

Production: Plants take 4-6 months from sowing to harvesting the seed, but up to 10 months in some Andean highland regions. Yields from 1-5 tonnes per hectare of seed are common. Yields of up to one kilogram of edible leaves have been harvested by pulling out plants from an area of one square metre. The young leaves or whole plants are eaten cooked. If plants are picked 3 or 4 times over 6-8 weeks then two kilograms of edible leaves can be harvested. From a plant that grows so quickly and is such good quality food this is a very high production.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf (dry)	6.0	1034	28.8	33	-	23.3	5.5
leaf	80	241	5.4	-	-	8.0	-
seed	-	-	13	-	-	-	-

Leafy greens

Common name: Sausage tree
Local:

Scientific name: *Kigelia africana*
Plant family: BIGNONIACEAE

Description: It is a tree which loses many leaves during the year. It grows 9-18 m high. The crown is rounded. The trunk is short and straight and about 80 cm across. It often branches from the base. The branches spread out and the secondary branches hang down. The bark is dark grey and smooth but flakes off in patches. The leaves are compound leaves growing in threes. They occur at the ends of branches. They are light green. The flowers occur on long rope like stalks. These can be 2-3 m long. The flowers are trumpet like. The flowers are on long sprays which hang downwards. The flowers point out and upwards. The petals are bright red with yellow veins. The flowers are 6-8-15 cm long. They have an unpleasant smell. The fruit is like grey green "sausages". These are 30-60 cm long and 10 cm across. The stalk remains hanging on the tree. The seeds are inside the pulp.

Distribution: It grows in warm subtropical and tropical areas. It grows in wet savannah. It is also found naturally along rivers in moist rainforest. It suits humid locations. It occurs between 1100 m and 3000 m altitude in Uganda. In Kenya it grows from sea level to 2200 m altitude and in areas with rainfall between 500-1500 mm per year. It cannot stand heavy frosts. It can grow in arid places.

Use: CAUTION: Both the ripe and unripe fruit are poisonous. The fruit pulp and bark are used for making beer. The seeds are used as a famine food after baking. The fruit are used with sugar to make drinks. The flowers are used in a sauce.

Cultivation: Plants are grown from seed. Seeds germinate poorly and slowly. Plants grow naturally from seeds. Seeds should be sown fresh. It can be grown from large cuttings.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
fruit	85.4	226	54	0.8	-	-	-
leaf	-	-	-	-	-	161	-

Leafy greens

Common name: Goat's horns
Local:

Scientific name: *Sida cordifolia*
Plant family: MALVACEAE

Description: An erect, woody shrub that grows about 0.4-1 m high. It keeps growing from year to year. It is covered with short and long hairs that make the plant feel soft. The leaf stalk is 1-2.5 cm long. The leaves are one after the other and heart shaped at the base. They are toothed at the edge and 1.5-4.5 cm long. The flowers are yellow and occur in the axils of the leaves. The fruit are about 6-8 mm across and have 20 fine bristles on the top.

Distribution: A tropical plant that grows in open waste places in the tropics and sub-tropics. It is common and widely distributed in the Philippines. It grows in hot arid places with a marked dry season. It grows in places with an annual rainfall below 520 mm. It grows in dry sandy soils and can grow in salty soils. It grows below 1100 m altitude. It can tolerate shade and can grow in arid places.

Use: The leaves are edible when cooked.

Cultivation:

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	6.6	1296	24.2	-	-	79.8	-

Image accessed from
http://upload.wikimedia.org/wikipedia/commons/f/f4/Sida_cordifolia_(Bala)_in_Hyderabad,_AP_W_IMG_9420.jpg

Leafy greens

Common name: Rose-pink sesame
Local:

Scientific name: *Sesamum calycinum*
Plant family: PEDALIACEAE

Description: A herb that grows for one or a few years. The stem can be single or branched. The leaves at the top are long and thin and with almost no stalk. Lower leaves can have stalks and be divided into lobes. The flowers are 2-5 cm long and purple or pink. The fruit is a narrow capsule.

Distribution: A tropical plant. In Kenya it grows from sea level to 3000 m altitude. It grows in light clay and sandy soils. It can grow in arid places.

Use: The young leaves are cooked and eaten. They are often cooked with other leaves such as Corchorus.

Cultivation: Plants can be grown from seeds. A spacing of 20 cm is suitable.

Production: The tender leaves are plucked off the bush.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	76.5	-	5.6	-	47.0	35.2	-

Image accessed from: http://www.zimbabweflora.co.zw/speciesdata/images/15/152550-2.jpg

Leafy greens

Common name: Yellow ipomoea
Local:

Scientific name: *Ipomoea obscura*
Plant family: CONVOLVULACEAE

Description: A slender trailing herb that lies along the ground. It can be a climber or twining. It has a taproot and can keep growing from year to year. The leaf stalks are 1.5 cm long. The leaf blades vary but are long and tapering to the tip with a broadly heart shape base. They are 4 cm long. The flowers occur singly or as a few together in the axils of leaves. The flowers are funnel shaped and 4 cm long and 3 cm across. They are pale yellow or white.

Distribution: It is a tropical plant. It grows up to 1800 m above sea level. It grows in woodland, grassland, savannah and coastal sands. It can grow in arid places.

Use: The leaves are cooked and eaten as a relish. The leaves are added to soup.

Cultivation:

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	56.6	569	8.8	-	-	28.8	1.1

Image sourced from: https://en.wikipedia.org/wiki/Ipomoea_obscura

Leafy greens

Common name: Hairy indigo
Local:

Scientific name: *Indigofera astragalina*
Plant family: FABACEAE

Description: An erect, hairy herb that grows 40-70 cm tall. The stems are soft. The leaves are compound with leaflets along the stalk. There are 5-13 leaflets. These can be 2-5 cm long. The flowers are small and reddish or purple. They are in groups 2-10 cm long.

Distribution: It is a tropical plant. It grows in areas with a rainfall of 650-800 mm per year and a temperature between 21°-32°C.

Use: The seeds are pounded with rice and eaten as a cake.

Cultivation:

Production: Seeds are produced in summer to autumn.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	51.0	2423	8.2	-	-	21.0	0.11

Image sourced from: https://indiabiodiversity.org/files-api/api/get/crop/observations//c7baebc2-243f-47f6-8d4c-6fb25eeaf372/a25bfc8de40149e4be0813fbc2e525b2.jpg?h=500

Leafy greens

Common name: Matara tea
Local:

Scientific name: *Senna auriculata*
Plant family: FABACEAE

Description: An evergreen shrub or small tree. It can grow to 7 m high. It has many branches. The branches have short hairs. The leaves are alternate and compound. They have leaflets along the stalk. There are 16-24 leaflets on short stalks. The leaflets slightly overlap. They have a sharp tip. They are more pale underneath. The flowers are large and bright yellow. They are arranged irregularly. They are in groups in the axils of leaves or at the ends of branches. They are 5 cm across on stalks 2.5 cm long. The fruit is a short pod 8-11 cm long by 1.5 cm wide. There are 12-20 seeds each in a separate cavity.

Distribution: A tropical plant. It grows in dry regions. In East Africa it grows from 150-610 m altitude. It requires full sun and rich light fertile well drained soil. It needs a pH between 5 and 7.7. It grows in regions with a rainfall between 380 and 4300 mm. It needs average temperatures between 16°C and 27.5°C. It is tolerant of drought. It can grow in arid places.

Use: The dried flowers are used as a coffee substitute. The dried leaves are used as tea. The young pods, leaves and flowers are eaten. The bark is bruised and allowed to ferment with molasses to make a drink. The bark contains tannins and alkaloids.

Cultivation: Plants can be grown from seeds. They are planted 10-15 cm deep and are put 5-13 cm apart. They are then thinned out. It can be cut back and will re-grow. It can also be grown from stem cuttings.

Production: Plants mostly flower in the hot season.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf		351	2.5	-	968	12.7	-

Leafy greens

Common name: Catkin blooming
Local:

Scientific name: *Opilia amentacea*
Plant family: OPILIACEAE

Description: A shrub or woody climber. It grows off other trees and plants. It grows to 4-10 m tall and has stems 20 cm across. The bark is rough and light grey. It has furrows along it and is corky. The aerial branches often hang downwards. The leaves are fairly smooth and leathery. They are 5-14 cm long by 2-5 cm wide. The midrib is prominent underneath the leaf. The leaf has a pointed tip. The leaf stalk is 0.3-0.7 cm long. The new leaves are bright shiny green. The base of the leaves is slightly curved backwards. The flowers are very small and yellow green. They are star shaped. They have a sweet scent. Many flowers occur together on short stalks around a central stem. These occur in the axils of leaves and are 2-3.5 cm long. The white-fleshed, edible fruit can occur singly or in clusters and are oval and fleshy. They are 1.5-3 cm long by 1.2-1.8 cm wide. They are pale yellow or orange when ripe. They have one seed inside. The seed is 21 mm long by 15 mm wide.

Distribution: A tropical plant that grows in tropical Asia. They occur near the beach in monsoon areas. They are often on sandy soil. They need fresh water so are often near streams. It can grow in arid places.

Use: The fruit are eaten fresh. **Caution.** If eaten in large quantities, the fruit can irritate the lips and tongue. Leaves are cooked as a vegetable.

Cultivation: It can be grown from fresh seed. The seed need to be placed on the ground surface, not buried.

Production: It fruits in the wet season. In Tanzania, leaves are collected from April to November.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	9.2	-	14.8	-	3.9	15.7	3.2

Image accessed from:
http://www.westafricanplants.senckenberg.de/images/pictures/opil_opilia_amentacea_rvbli_4_1163_e5e841.jpg

Leafy greens

Common name: Jute
Local:

Scientific name: *Corchorus olitorius*
Plant family: MALVACEAE

Description: An annual plant. It is upright, branching, and slightly woody. Plants vary in height, shape, leafiness and hairiness. Plants grown for leaves are usually only 30 cm tall. They also have many branches. Leaves are shiny and have leaf stalks. The leaves have teeth along the edge. The tips of the lowest leaves in each side, have long bristle like structures. Small clusters of yellow flowers grow in the axils of the leaves. The fruit are ridged capsules. They can be 7 cm long. These have partitions across them between the seeds. A ripe capsule contains 180-230 seeds. The seeds are dull grey and with four faces and one long point. Each seed has one pale line along it.

Distribution: A tropical plant. It is mostly coastal, below 250 m altitude. Temperatures of 22-35°C are suitable. It can stand both drought (2-3 weeks) and water-logging, except when young. A well-drained soil is best. They require humus-rich soils. A soil pH of 5.5-7.0 is best, but they can grow in soils with pH up to 8.5. They also need adequate moisture for good leaf production. A rainfall of 1000 mm is suitable. A high relative humidity (80-90%) is best. It produces seeds when day lengths are short. It grows in most African and Asian countries.

Use: The young leaves and stem tops are eaten cooked. They are slimy unless fried. They are also used to make a thick soup. Leaves can be sun dried, pounded to flour, then stored for a long time.

Cultivation: Plants grow from seed, and they can be transplanted. Seeds are often broadcast into fine seed beds at the beginning of the wet season. Mixing the small seeds with sand makes it easier to sow them evenly. Often seeds are slow to start growing. This can be overcome by soaking them in hot water. A spacing of 20-30 cm between plants is suitable. For vigorous varieties this could be increases to 45-50 cm. Seeds are saved from pods for re-sowing.

Production: First leaves can be harvested after 5-6 weeks. Tips about 20-30 cm long are picked. Production of edible green tips is not large. 7-8 kg of leaf tips can be harvested from 3-8 pickings over 3-4 months. Seeds can be collected after 13-15 weeks. If seeds of a particular variety are desired, it is necessary to grow these plants 16 m away from other plants, to avoid cross pollination. Seeds can be stored for 8-12 months in well-sealed jars.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf (raw)	80.4	244	4.5	1923	80	7.2	-
leaf (cooked)	87.2	155	3.4	156	33.0	3.1	0.8

Nuts, seeds, herbs and other foods

Common name: Coastal almond
Local:

Scientific name: *Terminalia catappa*
Plant family: COMBRETACEAE

Description: A large tree, up to 25-40 m tall. It loses its leaves during the year. The trunk can be straight or twisted. There can be buttresses up to 3 m tall. The branches lie horizontally and come out in layers. The leaves are long, smooth and shiny, with an abrupt point at the tip and a rounded base. Leaves tend to be near the ends of branches. Leaves can be 17-29 cm long and 10-15 cm wide. Young leaves have soft hairs. The leaves turn red and fall off twice a year. Flowers are greenish-white and in a spike at the end of the branches. The lower flowers on a spike are female, and the others are male. The fruit is about 6 cm long by 3-4 cm wide, thick and flattened, with a flange around the edge. The fruit are green and turn red when ripe. The pulp is edible.

Distribution: It grows on beaches in almost all tropical countries in the world, including Solomon Islands. It is a tropical plant, and sometimes cultivated as a shade tree. The tree is common in lowland areas particularly on sandy or rocky beaches. Seeds are spread by bats and sea water, as well as being planted by people. It is common along streets in coastal towns. It will grow from sea level up to about 800 m altitude. Plants are frost-susceptible. It can tolerate drought. It suits hardiness zones 11-12.

Use: The kernel of the fruit is eaten raw. An edible oil can also be extracted.

Cultivation: Plants can be grown from seed. Seeds can be stored dry for a year or more. Seeds germinate freely and most seeds grow. Insects can badly damage the leaves of young seedlings.

Production: It is fast growing. Nut production is seasonal.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
nut (fresh)	31	1810	15.9	-	4	4.6	4.9
nut (dry)	4.2	2987	20.0	-	2	6.3	8.8

Nuts, seeds, herbs and other foods

Common name: Sesame
Local:

Scientific name: *Sesamum indicum*
Plant family: PEDALIACEAE

Description: A small, erect annual plant. It is very branched and grows 1-2 m tall. The stem is stout, 4 sided and furrowed along its length. It is densely covered with fine, downy, glandular hairs that vary in shape. The lower leaves have long stalks and are spear shaped, often with lobes or a toothed edge. The leaf stalks are 3-11 cm long. The leaf blade is 4-20 cm long by 2-10 cm wide. Upper leaves are narrow and oblong. They are 0.5-2.5 cm wide. The flowers occur in the axils of upper leaves, either on their own, or in groups of 2 or 3. They can be white, pink, purplish and with yellow spots and stripes. The fruit can be smooth or rough and there are 2 chambers in the capsule. The fruit are brown or purple. They are oblong and deeply grooved. The seeds are small and oval. They are 3 mm by 1.5 mm and vary in colour from white, yellow, grey, red, brown or black. The fully ripe pods burst open.

Distribution: A tropical plant that suits the hot, dry, semi-arid tropics and sub-tropics. It can tolerate short periods of drought once established. It needs a temperature of 20-24°C in early growth, then 27°C for ripening. It grows from sea level to about 1200 m in areas with an annual rainfall of 400-1000 mm. Soils need to be well drained. It is very intolerant of water-logging. It cannot stand high humidity and needs frost free conditions. It needs a dry period for seed drying. It does not like acid soils. It grows in open sunny places. It can grow in arid places.

Use: The seeds are eaten. They are used in soups or fried or boiled. They are used in tahini and hummus. Seeds are eaten in the form of sweetmeats. Roasted seeds are used in pickles. They are also put on bread. Oil from the seeds is used in cooking and on salads. The refuse from the seed after the oil has been extracted is boiled in water and made into soup.

Cultivation: Plants are grown from seed. Seed will not germinate below 21°C. Seeds are broadcast on well prepared land and then harrowed in using a light harrow, or sown 2-15 cm apart in rows 20-45 cm apart. Plants can be thinned or weeded during early growth to produce a better crop. Seeding rates of 9-11 kg/ha are used. Some varieties shatter easily.

Production: Yields of 340-500 kg/ha are average. Plants reach maturity in 80-180 days. Crops are harvested as the leaves begin to drop. Plants are cut and stooked or dried in racks. The hull is removed by soaking in water overnight, then partly dried and rubbed against a rough surface.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed (dry)	4.7	2397	17.7	1	-	14.6	7.8
leaf (raw)	85.5	188	3.4	-	-	-	-
oil	0.1	3683	0.2	-	-	-	-

Nuts, seeds, herbs and other foods

Common name: Dark egusi
Local:

Scientific name: *Cucumeropsis mannii*
Plant family: CUCURBITACEAE

Description: A pumpkin family plant, like a cucumber, that lies along the ground. The vines can be 5 m or more long. The leaves are 9-18 cm long and 7-15 cm wide, alternate and simple. They are heart shaped at the base and have 3-5 lobes arranged like fingers on a hand. There are teeth around the edge. The flowers are yellow and are of separate sexes. The male flowers are in groups in the axils of leaves and female flowers occur singly. The fruit are about 25 cm long and 8 cm across. They are pale yellow and have many oval and flattened seeds. They are 1-2 cm long by 0.5-1 cm wide and are smooth and white.

Distribution: A tropical plant that grows in forests in tropical Africa. It grows up to 1150 m altitude.

Use: The seeds are parched and pounded to remove the seed coat. The kernels are crushed and added to soups and stews. The seeds are roasted and eaten as a snack. The flesh of the fruit is edible but not commonly used.

Cultivation: Plants are grown from seed. Often 3-4 seeds are planted in a hole. The seedlings appear within 6-8 days. It is often intercropped and allowed to climb stakes.

Production: Fruit are collected when the stems have dried and the fruit have changed from green to pale yellow or white. Seed yields can be 300-900 kg per hectare. After harvest, fruit are cracked or split open and allowed to rot for 14-20 days to help remove the seed from the pulp. (This creates a smell so is done away from houses.) The seeds are washed and covered with sand to prevent sticking. They are then dried and stored.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	8.3	2278	26.2	-	-	6.1	7.1

Image sourced from: https://live.staticflickr.com/3320/3620865165_471a9879d5_b.jpg

Nuts, seeds, herbs and other foods

Common name: Sweet basil
Local:

Scientific name: *Ocimum basilicum*
Plant family: LAMIACEAE

Description: An erect, branched, woody shrub. The branches are hairless and smooth. The leaves are hairless and oblong, with a narrow tip and blunt base. The base of the stems is tinged red. The leaf stalk is 1.5 cm long. The leaf blade is 2.5-5 cm long by 1-2.5 cm wide. The flowers are somewhat purplish, with very short stalks. The small nuts are smooth, oval and slightly flattened. Plants vary a lot, and several varieties have been selected. They can have liquorice, cinnamon or lemon flavours, and vary in size.

Distribution: It grows in many warm temperate countries, but also in the tropics. It suits both the lowlands and the highlands in the tropics. It cannot stand frost. It suits warm and hot climates. It needs some shade in tropical areas. It needs protection from wind. It needs rich, moist, well-drained soil. Soil should be at 25-30°C for seed to germinate. It suits hardiness zones 10-12.

Use: The seeds are soaked in water and eaten. The leaves are used raw or boiled to flavour foods. The seed yields an oil used to flavour sauces, pickles, meats and confectionary.

Cultivation: It is grown from seed. Seed should be sown 2-3 mm deep and covered with a light sand or soil. Seeds germinate within 3-5 days. Seedlings are thinned out to 20 cm apart. Seedlings can be transplanted. If top shoots are picked off, a more bushy plant is produced and flowering is delayed.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
leaf	91.0	113	2.5	386	18.0	3.2	0.9
seed	6.4	1051	14.4	938	61.2	42.0	5.8

Nuts, seeds, herbs and other foods

Common name: Safflower
Local:

Scientific name: *Carthamus tinctorius*
Plant family: ASTERACEAE

Description: An erect, annual herb that grows to 60-150 cm tall. It has many branches. It has spines but the numbers vary. The stems are white, stiff and round with fine grooves along their length. The types with more spiny leaves are better for oil production. The leaves are arranged in spirals around the stem. They do not have leaf stalks. The leaves are dark green and glossy. They are 10-15 cm long and 2-4 cm wide. The flower head is made up of many small flowers that are 13 mm long and like tubes. They are yellow to orange in colour. The fruit is 4 angled and has a hard hull and a single white or grey seed. The seed is oblong.

Distribution: It grows in both tropical and temperate zones. It does better in drier regions. It cannot tolerate waterlogging. It does not suit the low, wet tropics. It needs a good dry season for drying. It is resistant to drought. It can stand some wind and salinity. High temperatures can result in poor seed set. It does best where temperatures are 17-20°C on average. At the equator it can grow at 1600-2000 m altitude but most commonly in other regions it grows below 900 m altitude. A soil pH of 5-8 is suitable. It can grow in arid places.

Use: The young shoots and leaves are eaten cooked or raw. They can be seasoned with soy sauce. The seeds are hulled and roasted. They are eaten as snacks. They are also used in chutneys. The seed oil is used in cooking and as a salad oil. This can be done by boiling the seeds and floating off the oil. The dried, edible petals are used to colour foods. They can give red or yellow dyes. The slightly bitter petals can be cooked with rice.

Cultivation: Plants are grown from seed. A fine seed bed is required and seed are broadcast or drilled. It is best sown about 2-3 cm deep. Seeds germinate in 4-7 days and a soil temperature of 15°C is best. Plants should be topped as soon as the first buds appear to increase the number of flower heads. A spacing of 15-30 cm between plants is suitable. Wider spacing gives more heads per plant and closer spacing gives higher yields per area. A seeding rate of 20-30 kg per hectare is required. Crops respond to fertiliser if there is sufficient moisture. In very dry weather, harvesting in the moist morning or evening avoids seed shattering. Plants are uprooted and heaped for a few days before threshing.

Production: Plants take 120 days to maturity. Seeds are ripe about 35-40 days after maximum flowering. Plants are harvested when leaves turn brown.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	5.6	2163	16.2	5	0	4.9	5.5

Image accessed from: http://1.bp.blogspot.com/-Vyvwpq5La4c/U-gCRoPVHaI/AAAAAAAAWPg/_54ALJ6_Xuk/s1600/13+Carthamus+tinctorius+1.jpg

Nuts, seeds, herbs and other foods

Common name: Sunflower
Local:

Scientific name: *Helianthus annuus*
Plant family: ASTERACEAE

Description: An upright annual plant that ranges in height from 1-4 m. It has a strong tap root. Plants are mostly unbranched, but may have some branches. The stems are hairy. The leaves are large and oval to heart shaped with teeth around the edges. They are roughly hairy and mid to dark green. Leaves can be 10-40 cm long by 5-20 cm wide. The leaf stalk is long. The flowers are yellow and daisy like, and 9-20 cm across. Sometimes they are tinged red or purple.

Distribution: A temperate plant that suits the highlands of the tropics and can stand a light frost. It needs a well drained, rich soil. It is drought and frost resistant. Sunflower grow from the equator to 55°N latitude. It does not suit the wet tropics. It cannot tolerate very acid soils. It can grow in arid places. It suits hardiness zones 4-11. It is widely distributed in many environments.

Use: An edible oil is extracted from the seeds and used for cooking. Sometimes seeds are eaten raw or roasted. The seeds can be ground into a meal for use in bread and cakes. They are also dried, roasted and ground and used as a coffee substitute. The seeds are boiled with water and honey to make a drink. The germinated seeds are fermented into a yogurt or cheese.

Cultivation: Plants are grown from seed. Only well-filled seed should be planted. It is easy to save your own seed as dry seed stores well. A plant spacing of 1 m by 0.5 m is suitable. Seeds are sown at a depth of 2-4 cm. Mature heads are collected by hand, dried and then threshed.

Production: Time to maturity is usually 4-5 months. Seeds are ready to eat when the flower starts to wither.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	5.4	2385	22.8	5	1.4	6.8	5.1

Nuts, seeds, herbs and other foods

Common name: Linseed
Local:

Scientific name: *Linum usitatissimum*
Plant family: LINACEAE

Description: An annual herb with a single stem 70-100 cm tall. It branches only in the upper part when flowering. Varieties for flax are single stemmed while varieties for linseed seed are more branched. The leaves are small and hairless. The flowers are blue or white. The petals are 13-18 mm long. The capsule is 6-9 mm wide. It contains 10 seeds. These are flat and oblong.

Distribution: It needs a temperate climate. It can grow in moderately fertile soils. Plants have some drought and frost resistance. It has been grown in mountains in Java. In Argentina it grows from sea level to 1000 m above sea level.

Use: The seeds are crushed to make linseed oil. This has occasionally been used as a cooking oil. The oil is high in Omega-3. Flax seed has also been used to make tea. Roasted seeds are used as a coffee substitute. The seeds are also used in bread and cereals and can be sprouted. They can be used as an egg substitute in muffins, cakes and scones. The leaves are also eaten as a vegetable with sour cream and lemon. **Caution:** Some varieties contain high levels of poisonous alkaloids.

Cultivation: Plants are grown from seed and are generally self pollinated. It can be grown mixed with sesamum or chickpea.

Production: Plants take 24-27 weeks to mature.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	8.8	2059	19.5	0	1.3	6.2	4.2

Image sourced from: https://live.staticflickr.com/3154/2592675853_953c2e03aa_b.jpg

Nuts, seeds, herbs and other foods

Common name: Roselle
Local:

Scientific name: *Hibiscus sabdariffa*
Plant family: MALVACEAE

Description: A branched shrub up to 2 m tall. It has reddish stems, leaves and fruit. Different types vary in their height, shape and leafiness. The leaves are 7-10 cm across and lobed. The upper leaves often have more lobes than the lower leaves. The flowers are large and yellow and in the axils of the leaves. They are carried singly. The bracts at the base of the flower are enlarged and form a fleshy red fruit. This capsule is 3 cm long and contains 22-34 seeds. The seeds are dark brown and 4-6 mm long. 1000 seeds weigh about 25 g.

Distribution: A tropical plant that grows from sea level up to about 1000 m altitude. It will tolerate a range of soils and requires short days for flowering. It will grow in semi-arid locations. It grows best where average temperatures are in the range 25-30°C. It needs a temperature above 10°C. Plants will tolerate high temperatures. They grow up to 800 m altitude in Africa. A rainfall of 450-550 mm distributed over a 90-120 day growing period is required. It cannot tolerate waterlogged soils. It can grow in arid places. It suits hardiness zones 10-12.

Use: The swollen bases of the flowers are used for jams or drinks. The young leaves can be cooked and eaten. They can also be dried and used. The flowers can be used to flavour drinks. The seeds can be eaten. They can be dried and ground. They can be pressed for oil.

Cultivation: Seeds are sown and the seedlings can be transplanted. They are transplanted when 15-20 cm high. Seed should be planted 1-2.5 cm deep. A spacing of 50 cm x 50 cm is suitable although a wider spacing is used for fruit and a closer one for leaves. Plants can be propagated by cuttings.

Production: Fruit are ready 12-15 weeks after sowing. The bracts are picked 15-20 days after flowering. They can produce about 1 kg per plant. The yield of leaves can be 10 tons per hectare.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	8.2	1718	19.6	-	-	4.2	-
leaf	86.4	185	10.9	58	35	1.5	4.1
calyces	86.0	185	1.6	29	14	3.8	-

Nuts, seeds, herbs and other foods

Common name: African peach
Local:

Scientific name: *Sarcocephalus latifolius*
Plant family: RUBIACEAE

Description: A small tree or shrub that loses its leaves. It has many stems and grows 2-9 m tall. It can grow a large tree in forest. The trunk is crooked and can be 30 cm across. It can have several stems. The branches are thick and drooping. The bark is dark grey and very fibrous. It is deeply cracked. The leaves are shiny green but darker on top and paler underneath. They are a wide oval shape and 10-21 cm long. The tip is pointed and the base is rounded. The leaves are thick with deep veins. The leaf stalk is red-purple. It is about 2 cm long. The flowers are white-yellow and have a strong smell. They occur in single rounded heads about 4-5 cm across. The flowers are in a rounded "pin cushion" like head. The individual flowers have slender tubes. The flower stalk is 1-2 cm long. The fruit is a compound fruit. It is red or pinkish with a rough appearance and the flesh is deep red and watery. The fruit is pitted like a golf ball. It is a round ball about 5-8 cm across. The surface of the fruit is rough with 5 sided pits. They contain many small seeds. The seeds are very small, about 1 mm across. They lie in the flesh around the solid core. The flesh is edible.

Distribution: It is a tropical plant. There is a savannah form and a forest form across West Africa. It also grows on ant hills. It grows between 900-1100 m above sea level. It can grow in arid places.

Use: The ripe fruit are eaten raw and also used in soups. The fruit can be dried for later use. It is the pulp of the fruit that is eaten. A drink is prepared from the fruit. The flower heads are eaten as a vegetable. **Caution:** It can induce abortions. It is also used for arrow poison.

Cultivation: Plants can be grown from fresh seed. The seeds are very small. To separate the very small seeds from the fruit, mash the fruit then float it in a bucket of water. The seed will separate out and sink to the bottom. They should then be collected and slowly dried. Seed should be planted within 2 months. Plants can be cut back and will re-grow. They can be grown from cuttings or layering.

Production:

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seeds	-	305	6.4	-	-	23.7	3.0
fruit	75.1	173	1.9	-	35.8	1.4	-

Image sourced from:
https://th.bing.com/th/id/R.19a41a3af215f6655955aeeb6b5e66c8?rik=STs7lktmm%2fc3gA&riu=http%3a%2f%2fwww.westafricanplants.senckenberg.de%2fimages%2fpictures%2fsarcocephalus_latifolius_bn_dscn3283_1382_9d01d0.jpg&ehk=4aYK9W%2bYMFsXmxcH7TXBWjd9%2bS2ILISdptuDXlr%2buEw%3d&risl=&pid=ImgRaw&r=0

Nuts, seeds, herbs and other foods

Common name: Fluted pumpkin
Local:

Scientific name: *Telfairia occidentalis*
Plant family: CUCURBITACEAE

Description: A pumpkin family plant with a strong vine that loses its leaves during the year. Stems can be 10 m long. The leaves have 3-5 leaflets which look like claws. They are arranged like fingers on a hand. The stalk of the leaflets is about 2.5 cm long. The leaflets have teeth on the edge of the top part of them. They are often rough underneath. The vine has tendrils which are branched and with coiled tips which clasp objects. Plants are separately male and female. Male plants have tougher shoots and smaller leaves. The male flowers are on flower stalks 5-25 cm long. Female flowers occur singly and are on short stalks. Female flowers are in the axils of leaves. Male flowers are small, pink and in clusters. The fruit are pale green and covered with a white waxy layer that rubs off easily. Fruit are strongly ribbed at maturity. They can be 25 cm long and weigh 3-6 kg. The flesh is light yellow and fibrous. The seeds are flattened, round and 3.5 cm across. There are 30-70 seeds in each fruit.

Distribution: It is a tropical plant that grows in forest zones in Africa. It can grow in shade or bright sunlight. It can survive moderate droughts. It can grow in arid places.

Use: The thick shoots of the female plant are chopped and used in soups. The seeds are stripped of their coat then ground and used in soups. The seeds are also boiled in their seed coats then shelled and eaten. The seeds yield a cooking oil. The young shoots and leaves are used as a potherb. They are also added to soups and stews. They can also be dried and stored. **Caution**: The roots are poisonous.

Cultivation: Plants are grown from seed which can be sown directly or put in a nursery then transplanted. Seedlings appear within 12-15 days. The vines need a trellis to climb over. Male plants flower in 3 months while female plants take 4-5 months to flower. Seed can be stored for 3-4 months if kept dry and cool but the seeds must not be dried.

Production: The first leaf harvest can occur 12 weeks after planting. Seed harvest takes 8-10 months. Shoots can be picked 10-15 times over 4-5 months.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	Vitamin C mg	Iron mg	Zinc mg
seed	6.0	2280	20.5	-	-	-	-
leaf	86.0	197	2.9	-	-	-	-

Image sourced from: http://tropical.theferns.info/plantimages/1/7/179df45655f8ba2d0cf9ef4c29c97cf298f55729.jpg

Nutritional values of food plants by plant Family

Plant Family	Scientific name	Common name	Edible part	Moisture %	Energy kJ	Protein g	Vit A mg	Vit C mg	Iron mg	Zinc mg	Page
AMARANTHACEAE	*Amaranthus caudatus*	Grain amaranth	leaf (dry)	6.0	1034	28.8	33	-	23.3	5.5	52
AMARANTHACEAE	*Celosia trigyna*	Silver spinach	leaf	89.0	139	2.7	94	10	5.0	-	47
ANACARDIACEAE	*Mangifera indica*	Mango	fruit	83.0	253	0.5	180	30	0.5	0.04	36
APIACEAE	*Daucus carota* subsp. *sativus*	Carrot	root (raw)	89.9	180	1.0	2813	6	0.6	0.4	46
ASTERACEAE	*Carthamus tinctorius*	Safflower	seed	5.6	2163	16.2	5	-	4.9	5.5	66
ASTERACEAE	*Helianthus annuus*	Sunflower	seed	5.4	2385	22.8	5	1.4	6.8	5.1	67
BIGNONIACEAE	*Kigelia africana*	Sausage tree	fruit	85.4	226	54	0.8	-	-	-	54
CARICACEAE	*Carica papaya*	Pawpaw	fruit	88.0	163	0.5	290	54	0.4	0.18	34
COMBRETACEAE	*Terminalia catappa*	Coastal almond	nut (fresh)	31	1810	15.9	-	4	4.6	4.9	62
CONVOLVULACEAE	*Ipomoea batatas*	Sweet potato	root (baked)	72.9	431	1.7	2182	24.6	0.5	0.3	44
CONVOLVULACEAE	*Ipomoea obscura*	Yellow ipomoea	leaf	56.6	569	8.8	-	-	28.8	1.1	57
CUCURBITACEAE	*Cucumeropsis mannii*	Dark egusi	seed	8.3	2278	26.2	-	-	6.1	7.1	64
CUCURBITACEAE	*Cucumis melo*	Cantaloupe	fruit	93.0	109	0.5	300	30	0.4	0.2	39
CUCURBITACEAE	*Telfairia occidentalis*	Fluted pumpkin	seed	6.0	2280	20.5	-	-	-	-	71
CYPERACEAE	*Cyperus rotundus*	Nut grass	bulb	53.3	750	1.9	-	2	5.8	1.4	51
FABACEAE	*Acacia farnesiana*	Sweet acacia	seed (dry)	8.1	1522	36.6	-	-	6.0	0.6	20
FABACEAE	*Acacia holosericea*	Strap wattle	seed	6.6	1398	24.6	-	-	8.5	4.0	28
FABACEAE	*Arachis hypogaea*	Peanut	seed (dry)	4.5	2364	24.3	-	-	2.0	3.0	49
FABACEAE	*Canavalia gladiata*	Sword bean	seed	15.0	1335	27.1	-	-	-	-	26
FABACEAE	*Glycine max*	Soybean	seed	9.0	1701	33.7	55	-	6.1	-	22
FABACEAE	*Indigofera astragalina*	Hairy indigo	leaf	51.0	2423	8.2	-	-	21.0	0.11	58
FABACEAE	*Mucuna poggei*	Buffalo bean	leaf (dry)	8.3	-	32.4	-	-	10.6	0.24	23
FABACEAE	*Mucuna pruriens*	Velvet bean	seed	7.3	-	29.3	-	4.8	-	-	24
FABACEAE	*Parkia biglobosa*	African locust bean	seed	-	-	35	-	-	-	-	21
FABACEAE	*Parkia filicoidea*	African locust bean	seed (dry)	7.0	1780	32.3	-	6	33.2	-	50
FABACEAE	*Phaseolus vulgaris*	Common bean	seed (dry)	10.0	1386	25.0	10	1	8.0	2.8	27
FABACEAE	*Psophocarpus tetragonolobus*	Winged bean	seed	8.5	1764	41.9	-	-	15.0	4.5	19
FABACEAE	*Senna auriculata*	Matara tea	leaf	-	351	2.5	-	968	12.7	-	59
FABACEAE	*Vigna unguiculata subsp. catjang*	Honey bean	seed (dry)	7.5	1476	22.8	-	-	-	-	25
LAMIACEAE	*Ocimum basilicum*	Sweet basil	leaf	91.0	113	2.5	386	18.0	3.2	0.9	65
LAURACEAE	*Persea americana*	Avocado	fruit	74.4	805	1.8	480	11	0.7	0.4	40
LINACEAE	*Linum usitatissimum*	Linseed	seed	8.8	2059	19.5	-	1.3	6.2	4.2	68
MALVACEAE	*Abelmoschus esculentus*	Okra	pod (fresh)	88.0	151	2.1	185	47	1.2	-	43
MALVACEAE	*Corchorus olitorius*	Jute	leaf (raw)	80.4	244	4.5	1923	80	7.2	-	61
MALVACEAE	*Grewia tenax*	Small-leaved white raisin	fruit (dry)	9.2	1157	5.5	-	-	-	-	31
MALVACEAE	*Hibiscus sabdariffa*	Roselle	seed	8.2	1718	19.6	-	-	4.2	-	69
MALVACEAE	*Sida cordifolia*	Goat's horns	leaf	6.6	1296	24.2	-	-	79.8	-	55

Plant Family	Scientific name	Common name	Edible part	Moisture %	Energy kJ	Protein g	Vit A mg	Vit C mg	Iron mg	Zinc mg	Page
MORINGACEAE	*Moringa oleifera*	Moringa	leaf	76.4	302	5.0	197	165	3.6	-	48
MYRTACEAE	*Psidium guajava*	Guava	fruit	77.1	238	1.1	60	184	1.4	0.2	30
OPILIACEAE	*Opilia amentacea*	Catkin blooming	leaf	9.2	-	14.8	-	3.9	15.7	3.2	60
PEDALIACEAE	*Sesamum calycinum*	Rose-pink sesame	leaf	76.5	-	5.6	-	47.0	35.2	-	56
PEDALIACEAE	*Sesamum indicum*	Sesame	seed (dry)	4.7	2397	17.7	1	-	14.6	7.8	63
PHYLLANTHACEAE	*Maesobotrya barteri*	Bush berry	fruit	6.7	-	11.4	6.2	361	8.5	-	29
POACEAE	*Dactyloctenium aegyptium*	Comb fringe grass	seed	7.5	1234	9.8	-	-	6.9	4.7	16
POACEAE	*Digitaria exilis*	Hungry rice	seed (raw)	11.2	1470	7.1	-	-	8.5	0.82	12
POACEAE	*Digitaria iburua*	Black acha	seed (raw)	10.3	1470	8.9	-	-	10.0	-	13
POACEAE	*Eragrostis ciliaris*	Love grass	seed	10.6	1367	16.7	-	-	-	-	18
POACEAE	*Oryza glaberrima*	Floating rice	seed	11.3	1538	7.4	-	-	3.4	-	10
POACEAE	*Oryza punctata*	Wadi rice	seed	0	1482	13.9	-	-	17	3.9	11
POACEAE	*Pennisetum glaucum*	Bullrush millet	seed	11.6	1442	10.5	-	-	6.5	1.7	15
POACEAE	*Sorghum bicolor*	Sorghum	seed	-	1459	11.1	-	-	-	-	14
POACEAE	*Triticum durum*	Durum wheat	seed	12.5	1387	11.7	-	-	3.3	-	17
RUBIACEAE	*Sarcocephalus latifolius*	African peach	seed	-	305	6.4	-	-	23.7	3.0	70
RUTACEAE	*Citrus limon*	Lemon	fruit	83.3	65	1.1	-	80	0.4	0.1	33
RUTACEAE	*Citrus reticulata*	Mandarin	fruit	87.6	184	1.5	42	136	0.8	-	32
SOLANACEAE	*Capsicum frutescens*	Bird's eye chillies	fruit	74.0	395	4.1	7140	121	2.9	-	42
SOLANACEAE	*Physalis peruviana*	Cape gooseberry	fruit (mature)	84.2	201	2.0	360	30	1.5	-	38

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