

Study Guide
for Hospitality
Students

Creating impact

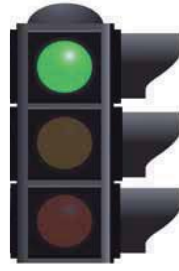
*New Zealand grows some of the best tasting,
highest quality vegetables in the world –
always add them to your menu.*



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Go for green - support the New Zealand grower

Vegetable Availability



PLENTIFUL

SHORT SUPPLY

UNAVAILABLE

IMPORTED

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Artichokes - globe	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Artichokes - Jerusalem	Red	Red	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green
Asian vegetables	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Asparagus	Yellow	Red	Red	Red	Red	Red	Red	Red	Yellow	Green	Green	Green
Beans	Green	Green	Green	Yellow	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Green
Beetroot	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Broccoli	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Broccolini	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Brussels sprouts	Grey	Grey	Grey	Green	Green	Green	Green	Green	Green	Yellow	Red	Red
Buttercup squash	Green	Green	Green	Green	Green	Green	Yellow	Red	Red	Red	Red	Red
Butternut	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Cabbages	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Capsicums	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Carrots	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Cauliflower	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Celeriac	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Yellow
Celery	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Chilli peppers	Green	Green	Green	Green	Green	Yellow	Red	Red	Red	Red	Yellow	Green
Chokos	Red	Red	Red	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
Courgettes	Green	Green	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green
Cucumber	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Daikon radish	Red	Red	Red	Red	Green	Green	Green	Green	Green	Green	Green	Green
Eggplant	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Fennel	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Garlic	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Garlic - imported	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Ginger - imported	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Herbs	Green	Green	Green	Green	Green	Yellow	Green	Green	Green	Green	Green	Green
Indian vegetables	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green
Kale/cavalo nero	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Kohlrabi	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Kumara	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Leeks	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Green
Lettuces	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Melons	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Microgreens	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Mushrooms	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Okra - imported	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Onions - brown	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Onions - red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Parsnips	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Peas	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Yellow	Green	Green
Potatoes	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Puha	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Pumpkins	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Yellow
Radishes	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Rhubarb	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Green	Green	Green	Green
Salad greens	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Silverbeet	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Snow peas	Green	Green	Green	Green	Green	Grey	Grey	Grey	Grey	Green	Green	Green
Spinach	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Spring onions	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Sprouted beans and seeds	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Swedes	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Yellow
Sweetcorn	Green	Green	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Yellow
Taro - imported	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Tomatoes	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Tomatoes - imported	Red	Red	Red	Red	Grey	Grey	Grey	Grey	Red	Red	Red	Red
Turnips	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Green
Watercress	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Witloof	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Yams	Red	Red	Red	Yellow	Yellow	Green	Green	Green	Green	Yellow	Yellow	Red

Please contact your supplier for regional/seasonal availability as variations in supply will occur depending on region, season and weather.

Classifications

Vegetables are classified according to which part of the plant is eaten. Some vegetables may fall into more than one classification when more than one part of the plant is eaten, e.g. roots and leaves of beetroot can be eaten.



Roots	The underground, edible root of a plant that is usually a long or round shaped tap root.	Carrot, turnip, swede, radish, parsnip, beetroot, celeriac, daikon radish, ginger
Tubers	Grow underground on the root of a plant. Tubers are usually high in starch.	Potato, kumara, yam, taro, Jerusalem artichoke, earth gem
Bulbs	Bulbs grow just below the ground and usually consist of layers or clustered segments. They produce a fleshy leafy shoot above ground.	Garlic, onion, leek, shallot, spring onion, fennel
Leaves	The edible leaves of vegetables.	Spinach, lettuce, silverbeet, Brussels sprouts, witloof, puha, bok choy, tat soi, tung ho, wong nga baak, cabbage, kale, cavolo nero, watercress, herbs, microgreens, salad greens
Stems	The edible stalks of plants when the stalk is the main part of the vegetable.	Celery, asparagus, kohlrabi, rhubarb
Flowers	The edible flowers of certain vegetables.	Cauliflower, broccoli, gaii laan (Chinese sprouting broccoli), broccoflower, broccolini, globe artichoke, choi sum, courgette flower
Fruits	Vegetable fruits are fleshy and contain seeds which are sometimes eaten with the flesh.	Eggplant, capsicum, chilli peppers, tomato, cucumber, pumpkin, buttercup squash, butternut, courgette, okra, scallopini, choko, melon
Seeds	Edible seeds, also known as legumes, usually grow in pods which are sometimes eaten with the seeds.	Peas, beans, snow peas (mange-tout), sprouted beans and seeds, sweetcorn
Fungi	When referring to vegetables, fungi are known as mushrooms.	Button, Swiss brown, portabello, shiitake, oyster (phoenix tail), enokitake, white ear (jelly fungus), black ear (cloud or wood ear)

Table source: The New Zealand Chef, Lesley Christensen-Yule, Lindsay Neill. 3rd ed. Pearson 2013

Maintaining quality...

Vegetables are living items of food which begin to deteriorate as soon as they are harvested. An understanding of the causes of deterioration can help in maintaining the quality of vegetables. Deterioration is caused by both biological and chemical reactions.

Biological deterioration

• Respiration

Vegetables are composed of living tissue and they continue to respire ('breathe') after harvesting. In respiration, stored nutrients such as sugar are used up by vegetables and the product starts to deteriorate. Vegetables respire at different rates. Vegetables that respire quickly perish soon after picking.

Respiration is slowed by cold storage. For example, sweetcorn may lose 50% of its initial sugar content in a single day at 21°C (room temperature), while only 5% will be lost in one day at 0°C. With certain exceptions the best temperature for slowing deterioration by biological reactions is 1°C. However, standard refrigerator storage at 4°C is still very effective at slowing decay.

• Micro-organisms

Vegetables are also covered with micro-organisms such as bacteria, which will cause decay in conditions of warmth and humidity. Damage which breaks the skin of vegetables and allows micro-organisms to enter, will also result in decay. Refrigeration is the best method of reducing decay, as most micro-organisms will stop growing at low temperatures.

• Moisture loss

Loss of moisture occurs naturally as vegetables age and leads to wilting and shrivelling. This is one of the obvious ways in which freshness is lost. Moisture losses from 3-6% are enough to cause a marked loss in quality for many vegetables.

• Bruising

Rough handling has a flow on effect. Bruising increases the rate of respiration and therefore shortens shelf life. Damage also results in more moisture loss and flavour changes.

Chemical deterioration

Ethylene is a gas, naturally produced and given off by vegetables. It is useful in speeding up ripening but after ripening it leads to decay. Different vegetables respond differently to ethylene. Most vegetables produce ethylene in low, medium or high amounts. Some are mildly sensitive to ethylene and others are extremely sensitive. Therefore it makes sense to store ethylene producing and ethylene sensitive produce separately from each other.

- Ethylene producing. Avocados, as well as many fruits, are high ethylene producers. These include: apples, tomatoes, passionfruit, stone fruit (e.g. apricots, plums), bananas, pawpaw, kiwifruit, pears, melons.
- Ethylene sensitive: Asian greens, globe artichoke, asparagus, beans, broccoli, Brussels sprouts, cabbage, carrot, cauliflower, celery, courgette, cucumber, eggplant, kumara, lettuce, parsley, peas, potato, rhubarb, silver beet, spinach, sweet corn.

Refrigeration slows chemical deterioration especially when ethylene producers are stored separately from those that are sensitive to ethylene. Many colour changes associated with ageing and ripening can also be delayed and slowed by refrigeration.



In New Zealand we have an assurance programme known as New Zealand GAP. This stands for Good Agricultural Practice. It provides a traceable, accountable system from crop to customer and ensures that best practices are employed in the production, packaging and distribution of vegetables.



Buying vegetables...

- Choose a reliable supplier.
- Buy regularly; every 2-3 days if possible. It is better to buy smaller quantities more often because fresher vegetables are more nutritious and taste better.
- Reject and return poor quality vegetables to the supplier.

By meeting the standards required under New Zealand GAP, growers are able to demonstrate to their customers that their products are of a high quality, produced in a sustainable manner and are safe to eat. New Zealand GAP has been successfully benchmarked against international quality assurance programmes, such as Global Gap, as well as New Zealand and Australian supermarket programmes.

Storing vegetables

- Handle with care. Bad handling accelerates deterioration. Most vegetables should be handled as if they are as fragile as an egg.
- Store vegetables correctly. Storage conditions greatly affect shelf life. Vegetables should be transferred to the correct storage conditions as soon as possible after purchase and transit.
- Use the chiller or refrigerator correctly. Air must be able to circulate around the vegetables; hot spots will develop if over-packed.
- Keep all storage areas clean. Decaying or rotting vegetables produce high amounts of ethylene.
- Store ethylene producing and ethylene sensitive produce separately if practical. While separate storage is preferable, some smaller operations may not have the facilities to do this. Ensure that the store room is ventilated regularly to avoid ethylene build up. Low temperatures retard ethylene damage.

Important points for vegetable storage

Most vegetables benefit from storage in a refrigerator (1-4°C) or cool store (7-14°C). Ideally vegetables should be stored separately from raw meat.

Specifically:

Roots

- Best refrigerated.

Tubers

- Best kept in a dry and ventilated cool store, away from light.
- Never refrigerate.

Bulbs

- Store garlic and onions in a dry, dark, ventilated cool store and away from other foods that may absorb their flavours.
- Seal leeks and spring onions in plastic and refrigerate.

Leaves

- Best sealed in plastic and refrigerated.

Stems

- Refrigerate.
- Best if stem ends are kept wet (especially asparagus), otherwise wrapped in plastic.

Flowers

- Wrap in plastic, refrigerate.

Fruits

- Soft fruit deteriorate quicker than hard, e.g. courgettes have a shorter shelf life than hard-skinned squash such as pumpkins.
- Refrigerate most soft fruit.
- Store whole pumpkins and hard squash in a dry, cool store, away from light.
- Store cut portions after removing seeds, by wrapping in plastic and refrigerating.
- For better flavour, store tomatoes at room temperature (18-20°C). Do not refrigerate unless they are over-ripe.

Seeds / legumes

- Wrap in plastic, refrigerate.

Fungi

- Refrigerate.
- If purchased loose, store mushrooms in a paper bag.
- If purchased in packages, do not open until ready to use. However, storing in air-tight containers, plastic bags or leaving sealed in cling film, will cause condensation and speed spoilage of fungi.

Vegetable cuts

Different vegetable cuts suit particular dishes. The following are the traditional cuts based on French classical cookery.



Brunoise

This is a very small diced cube, sized between 1-3 mm square. Often used as a garnish for consommé. Typical vegetables used are carrot, onion, turnip and celery.



Macedoine

This is diced cube 5 mm square. Root vegetables are suited to this cut, e.g. carrot, turnip, swede.



Jardinière

A short thin baton or stick, about 2.5 cm long and approximately 3 mm wide and 3 mm thick. Size may be varied depending on end use.



Baton

Sticks of vegetables approximately 5 cm long, 5 mm wide and 5 mm thick. Used as an accompaniment.



Paysanne

Various thin shapes such as squares, triangles, circles or half rounds. In order to cut economically, the shape of the vegetable will decide which shape to choose. All are cut thinly, about 1-2 mm thick.



Julienne

Long thin match-stick shaped pieces about 4 cm in length. Vegetables cut julienne are mostly used as garnish.



Chiffonade

Finely sliced or shredded green leafy vegetables, usually lettuce or spinach. Mostly used as a base for serving food or as a garnish.



Mirepoix

A mixture of roughly chopped vegetables which are used as the flavour base for sauces or other dishes. Usually includes onion, celery and carrot.



Matignon

Roughly cut vegetables cooked in butter, with ham, thyme and bay leaf, finished by deglazing the pan with a little Madeira or wine. Usually includes onion, celery and carrot. Used to add flavour, especially when braising large pieces of meat.

Cooking guide

Most vegetables suit many different cooking methods. This makes them versatile to prepare, cook and serve. Think variety, think vegetables.

Dense vegetables require longer cooking times, e.g. carrot, potato, kumara. Vegetables with higher water content cook faster, e.g. capsicum, leafy greens.

These preparation guidelines apply to all cooking methods:

- Wash thoroughly.
- To maintain nutrients, don't leave vegetables soaking in water.
- Leave skin on if suitable.
- If peeling, use a peeler to remove skin as thinly as possible.
- To avoid bruising and nutrient loss, use a very sharp knife.
- To ensure even cooking, cut into evenly-sized pieces.
- Prepare as close to cooking time as possible.
- Cook as close to serving time as possible.
- Cook until tender. Don't overcook.
- Prolonged heating destroys nutrients so cook as quickly as possible.
- For quicker cooking of large amounts of vegetables, cook in batches.



As a general rule, when boiling, if the vegetable grows above the ground place into boiling water, if it grows below the ground start in cold water. The exception is new potatoes which are started in boiling water.

Boiling

- Add vegetables to either boiling or cold water as required (see rule above).
- Ensure vegetables are completely covered by water throughout cooking.
- To avoid vegetables breaking up, boil gently rather than rapidly.
- Cook green vegetables without a lid to maintain vibrant colour.
- Cook until tender when tested with a fork or skewer.
- Drain in sieve or colander before serving.

Baking

- Preheat the oven to 200°C.
- Some vegetables need special attention, e.g. seeds are removed from pumpkin.
- Season and bake directly on an oven rack or lightly greased tray.
- Bake until soft when tested with a fork or skewer.
- As a guide, a medium sized potato will take 45-55 minutes.
- Remove seeds and stuff vegetables prior to baking, e.g. marrow, capsicum, tomato and pumpkin.

Braising

- Choose a braising pan with a close fitting lid. Grease the base and add mirepoix or matignon.
- Most vegetables require blanching in boiling water and refreshing in cold water before braising. This makes them softer, easier to shape to the pan, quicker to cook and helps maintain colour.
- Add vegetables to the pan with seasoning and a flavoursome liquid or stock to come half way up the vegetables, cover with buttered paper and the lid.
- Braise at 160-170°C until tender.
- Drain well before serving.
- If possible use some of the braising liquid as the basis for a sauce.

Deep Frying

- Always use fresh clean oil suitable for deep frying.
- Heat the oil to the correct temperature before adding vegetables. Cook medium to large vegetables at 160-165°C. Cook small thin pieces at 175-190°C. (Chips should be cooked at 175°C – see www.vegetables.co.nz for more details on Chip Group Standards.)
- Coat or batter vegetables, except chips, before adding to the oil.
- When batch-cooking vegetables, ensure the oil returns to temperature between batches.
- Drain on absorbent paper before serving.

Grilling, char grilling or barbecuing

- Preheat the grill.
- Brush vegetables with oil and season before grilling.
- Cook under or over direct heat, turning during cooking as required.
- Cooking times vary depending on the intensity of the heat and the size of the pieces of vegetables.
- To grill until tender without burning surface layers, pre or partly cook dense vegetables, e.g. kumara, carrot or potato; alternatively just slice thinly.
- During cooking the vegetables may be basted with plain or flavoured oil, or a marinade.

Roasting

- Preheat the oven to 180-200°C.
- Toss vegetables in a small amount of vegetable oil or fat.
- Add seasoning and any flavourings, e.g. herbs.
- Roast in a roasting pan or on a tray until tender.
- To limit fat absorption, roast vegetables in a separate pan from meat.

Traditionally vegetables that are hard or high in starch, such as potato or parsnip, have been roasted. However, other vegetables such as asparagus and eggplant may also be roasted. Slow roasting, at around 150°C, intensifies flavours.

Roast until moisture has been lost, but the tomatoes are not dried out.

Tomatoes slow roast well. Drizzle with olive oil, a dash of balsamic vinegar (optional), and seasoning. Serve slow roasted vegetables hot or cold, or toss through leafy greens.

Sautéing

- Use small even cuts of vegetables.
- Add to a small amount of fat or oil heated in a pan.
- To promote even cooking and colour, toss vegetables while frying.

Meals with generous quantities and a variety of vegetables look appetising and are enjoyable to eat.

Shallow frying

- Heat oil before adding vegetables.
- Use the correct sized pan for the food being cooked i.e. do not overcrowd, and fry in batches if required.
- To avoid spatter from hot fat, ensure vegetables are dry before adding to the pan.
- When mixing together, fry dense vegetables before adding lighter, softer ones.
- Drain on absorbent paper if necessary.
- Season before serving.

Stir frying

- Prepare all vegetables before starting to cook.
- Shred, dice or thinly slice the vegetables into pieces the same size.
- For even cooking, some vegetables benefit from blanching and refreshing before adding to stir fry, e.g. cauliflower florets.
- Ensure all vegetables are dry before adding to the hot pan.
- Heat the oil in the wok or pan to a high temperature before adding the vegetables.
- Cook dense vegetables first (e.g. carrot) and add the less dense ones towards the end of cooking (e.g. cabbage).
- When the oil dries out add a sprinkling of water. Best results are achieved if the vegetables are hot and steamy.

Stir fried vegetables are cooked rapidly in a minimum of liquid, or oil, so fewer nutrients are lost or destroyed.

Steaming

- Steaming may take place in special steaming ovens, in pressure cookers or by placing food in steaming baskets or trays over boiling water.
- Don't overcrowd vegetables. Allow room for steam to circulate.
- If steaming over water, ensure vegetables do not come in contact with it. Also, make sure the saucepan does not boil dry. Cover tightly and adjust the heat to a steady simmer.
- Steam until vegetables are tender.

Salads

- Use a sharp knife.
- Make sure salad greens are well dried after washing. Water left on the leaves dilutes dressings and flavour.
- Salads made entirely of dense vegetables, e.g. carrot, cabbage, potato, should be dressed ahead of time to allow flavours to be absorbed.
- To avoid wilting, dress leafy salads just before service.

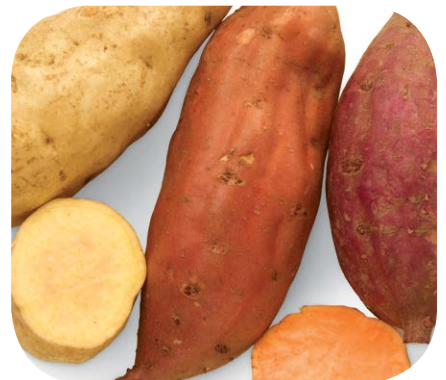


Vegetables at their best

Vegetables supply many valuable nutrients, including vitamins, minerals and antioxidants.

For best results, and to minimise nutrient loss, buy regularly, store correctly and practice good stock rotation (first in - first out). This will ensure that produce is retained in excellent condition and waste is minimised.

- When washing vegetables, do not leave them to soak in water. Some vitamins and minerals dissolve into water.
- Peel the skin thinly or leave it on. Nutrients are often at their highest concentration just beneath the skin. Peeling can mean that many nutrients are thrown away.
- Use a sharp knife when cutting vegetables to minimise cell damage. Damaged cells release enzymes which destroy vitamin C.
- Cook vegetables as soon as possible after preparation and use the minimum amount of water when cooking.
- Water soluble vitamins B and C will leach into the cooking water which is often thrown away. Save this for use in soups, stocks and gravies.
- Do not overcook vegetables. Most should be tender but still slightly crisp; however, starchy vegetables such as potatoes and kumara, should be tender throughout.
- Cook vegetables as close to service time as possible as heat-sensitive vitamins will be destroyed if held at a high temperature for prolonged periods. Batch cook if necessary.



Much of this information was sourced from The New Zealand Chef, 3rd ed. Pearson 2013 by Lesley Christensen-Yule, Lindsay Neill and Hamish McRae.

For more information on specific vegetables visit www.vegetables.co.nz or consult The New Zealand Vegetable Guide.

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