

Sustainable agriculture for the future

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Processing Options for Cucurbits

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The Cucurbitaceae family encompasses 965 species in around 95 genera of plants known collectively as gourds or cucurbits. It includes squash, pumpkin, zucchini or courgette, some gourds, calabash, watermelon, cucumber, melons, bitter melons, and luffa and are some of the earliest plants cultivated for human consumption.

Cucurbits supplies humans with food as well as useful fibres, and although plants in this family are very similar in their development, they possess a high genetic diversity for fruit shape and fruit characteristics, which results in a variety of uses.

GENERAL DESCRIPTION AND SOME PROCESSING OPTIONS:

Butternut

Butternut squash are increasingly being processed to meet today's fast-paced consumer's demand for more convenience, as the vegetable is difficult and time-consuming to peel and prepare.

The ideal butternut cultivar for processing should have a relatively soft rind (when picked young) with the minimum greening, rich orange colour and firm flesh. Cultivars with cylindrical shape, small or no "bulb" and small

seed cavities are ideally suited for mechanical peeling and cutting, rendering the minimum losses due to irregularity in shape.

- Fresh cut butternut pieces are fresh fruits that have been physically altered from its original form but remain fresh. It has been trimmed, peeled, washed, and cut to make a product that is 100 % usable, with no wastage. The pieces are packaged for consumer convenience but require refrigerated storage.
- Butternut is commercially frozen in cubes (dice) or slices. Different freezing techniques can be used including blast and plate freezing as well as individual quick-freezing. The packaging ranges from 300g retail packs to 13 kg bulk packs.
- Butternut puree is dehydrated on drum dryers to produce a dry, flaked product with long shelf life that is easy to re-hydrate into a vegetable side dish, filling for pies or baby food.
- Canned butternut is refined butternut puree that is preserved in a can by means of a heat treatment.

Courgettes (Marrows)

Baby marrow, courgettes, or zucchini (Cucurbita pepo) is one of the most popular

types of summer squash. It can be found in dark, medium, and light green colours as well as yellow-orange varieties. Courgettes are harvested at a very immature stage. The plants start producing in about 50 - 60 days from planting, depending on the cultivar and temperature. Processing options are limited to minimal processing, pickling, and freezing.

Baby marrow have become very popular additions to salads, pastas, stir-fry dishes and grilled vegetable dishes. It is increasingly being processed to meet today's fast-paced consumer's demand for more convenience. The ideal baby marrow cultivar for processing should have a dark green colour, long straight shape, and firm flesh.

- Baby marrow can be frozen in sliced or diced form. This is usually done in combination with other vegetables as part of a stir fry pack.
- Courgettes (baby marrow or zucchini) are common ingredients in vegetable pickles. It can either be pickled alone or in combination with other vegetables such as onion, gherkins, cauliflower, green beans, carrots etc. The product is preserved by the low pH (< 4.5) of the packaging liquor and a pasteurisation treatment. It is sealed in cans or other suitable container such as glass jars.
- Minimally processed baby marrow is cleaned, sorted, and packed in a ready-to-use state either as whole fruit or in slices and stored under refrigeration. Sliced pieces may be mixed with other sliced vegetables

in stir fry or salad packs.

Cucumber

Cucumbers are basically divided into two categories, namely pickling cucumbers and slicing cucumbers. Pickling cucumbers are used for processing or pickling. They have thin skins and are short and blocky. Their colour gradually changes from dark green at the stem end to light green at the blossom end. There are basically two kinds of pickles that can be prepared from cucumbers, namely fermented pickles, or fresh-pack pickles.

Slicing cucumbers are sold fresh for immediate consumption, usually as a salad item. Their skins are thicker and dark green. Slicing cucumbers are longer than pickling types and their thicker skins are more resistant to damage during handling and transport. Slicing cucumbers may be produced in the field or in greenhouses.

- Fresh-pack pickled cucumber and gherkins are made by the addition of an acid such as vinegar and not by the natural fermentation of the vegetable. The product is further preserved by pasteurisation.
- Fermented cucumber pickles or brined pickles undergo a curing process for several weeks in which fermentative bacteria produce acids necessary for the preservation of the product. These bacteria also generate flavour compounds that are associated with fermented pickles. Initial fermentation may be followed by the addition of acid to produce such products as half dills or sweet gherkins.





Pumpkin

The Cucurbitaceae family is made up of hundreds of species including pumpkin, melons, squash, marrows, and gourds. Plants of this family are generally annual or perennial vines and are adapted to the arid and semi-arid regions. These plants are easily damaged by frost and the range is limited to warm climates by the length of the growing season.

- Pumpkin puree is dehydrated on drum dryers to produce a dry, flaked product with long shelf life that is easy to rehydrate into a vegetable side dish, filling for pumpkin pie or baby food. Pumpkin cultivars with firm flesh, high total solid content and intense orange colour are preferred for drying.
- Pumpkin pieces can be frozen with success, provided the best suited cultivar is used. The flesh must be an intense orange colour and firm with a high total solids content. Watery pumpkin varieties must be avoided.
- Fully ripe pumpkins are cooked and then pureed to produce a product that can be eaten as such or used in various other products. The puree is preserved by freezing.
- Roasted pumpkin seed is a by-product from various other pumpkin products where the flesh is processed, and the seeds discarded. The seeds are dried, cleaned and roasted. Flavouring is optional. The seeds are consumed as a nutritious snack along with nuts and dried fruit.

Sweet Melon

Melon is the common name for any one of numerous varieties of sweet fruits of the



gourd family that grows on two species of trailing vines. One of these vines bears the sweet melons (muskmelons, winter melons and the European cantaloupe) and the other bears the watermelon.

Muskmelons have a soft, ribbed rind with distinct netting and musk flavour. The flesh colour varies from salmon-pink to deep orange. They are the most perishable of the melons.

Winter melons, of which the honeydew is best known to the SA market, are less aromatic than muskmelons, take longer to mature and have harder rinds that preserve them well after the growing season. The honeydew has a smooth rind with green pulp. Winter melons are classified as *Cucumis melo* var. *inodorus*.

The processing options for sweet melons are limited to the production of pulp and ready-to-use salads with or without syrups. The pulp may be further processed into sauces, beverages, and desserts.

- Melon is cut, peeled, and cored and the flesh cut in pieces or shaped into balls for salads. The pieces are then rapidly frozen.
- Fresh market muskmelon has a soft, ribbed rind with distinct netting and musk flavour. The flesh colour varies from salmon-pink to deep orange. They are the most perishable of the melons.

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