Natural Toxins in Food Plants

Common Plant Toxins

Food	Toxins	Safety Measures
Green beans, Red kidney beans, White kidney beans	Lectin (Phytohaemagglu-tinins)	● Cook thoroughly at boiling temperature after thorough soaking in water. ● Do not use raw or inadequately - cooked beans in the preparation of salad dishes. ● Tinned beans are safe to eat without further cooking
Soyabean	Trypsin inhibitors	● Cook thoroughly at boiling temperature after thorough soaking in water.
Bitter apricot seeds, Bamboo shoots, Cassava, Flaxseeds, Seeds of stone fruits	Cyanogenic glycoside	● Remove the peel and soak in water, cut into small pieces and cook thoroughly in boiling water ● If it is cooked in dry-heat or with little water, limit the intake
Potatoes	Glycoalkaloids	● Glycoalkaloids are not destroyed by cooking. Avoid buying or consuming sprouted, greened or damaged potatoes
Ginkgo biloba	4'-methoxypyrido-xine (4'-MPN)	● Cook seeds thoroughly, do not consume uncooked seeds ● Limit the intake of the ginkgo seeds, especially for children
Fresh Jin Zhen	Colchicine	● dried Jin Zhen can be safely consumed
Cabbage, Cauliflower, Broccoli, Mustard, Turnip	Goitrogens	● toxins can be reduced by heating
Wild Mushrooms	Amanitins Gyromitrin Muscarine Phallotoxins	● most of the toxins in wild mushroom cannot be destroyed by heat ● do not pick/ consume wild mushrooms
Giant elephant's ear	Oxalate	● do not pick/ consume wild plants

Natural Toxins in Food Plants - Results of the Study

Potatoes

1. Glycoalkaloid contents detected in the five different types of the potatoes commonly found in Hong Kong (new potato, russet potato, red-skinned potato, and two kinds of yellow-skinned potato) ranged from 26-88 mg/kg, within the normal range of 20-100 mg/kg at which JECFA considered not of concern for daily consumption.

2. Glycoalkaloids were concentrated in the peel portions. No detectable levels of glycoalkaloids were found in the flesh.

3. The highest concentrations of glycoalkaloids were found in potato sprouts with a level of 7600 mg/kg.

Cyanogenic plants

1. Cyanogenic glycosides were present in bitter apricot seed, bamboo shoot, cassava and flaxseed samples in their raw state, with releasable cyanide levels ranging from 9.3 to 330 mg/kg.

2. Higher cyanide contents were found in bitter cassava than sweet cassava.

3. The highest concentration was found at the tip portion of bamboo shoot, followed by the middle portion, then the base portion.

4. Cutting cyanogenic food plants into small pieces and cooking them in boiling water reduced cyanide contents of the food commodities by over 90%.

5. Dry heat could not reduce cyanide contents effectively in flaxseeds.

Advice to trade

1. Store potatoes in a cool, dry and dark environment. Avoid keeping stocks for prolonged periods.
2. Display a smaller stock at any one time.
3. Discard stocks that show signs of sprouting, greening, physical damage or rotting.
4. Do not use sprouting, greened or damaged potatoes for making food products.

Advice to public

Purchase

1. Avoid buying potatoes that show signs of sprouting, greening, physical damage or rotting.

Storage

1. Remove potatoes from plastic bags and place them in a cool, dry, and dark place at home.
2. Store only small amounts of potatoes at home.
3. Discard potatoes that show sign of sprouting, greening, physical damage or rotting.

Preparation and consumption

Potatoes

1. Avoid eating potatoes that show signs of sprouting, greening, physical damage or rotting.

Cyanogenic plants

1. Cutting the cyanogenic plants into smaller pieces and cook thoroughly in boiling water to release toxic hydrogen cyanide before consumption helps reduce the level of the toxin. Since hydrogen cyanide is volatile, it is easily removed by open-lid cooking.

2. When the cooking method chosen is heating under dry-heat or at low moisture contents, limit the intake of the cyanogenic plants to only small amounts.