



Natural Toxins in Fruits and Vegetables

Most fruits and vegetables contain small amounts of natural toxins which are of no concern when the food is consumed as part of a varied diet and eaten in moderation. Moldy or damaged plants may contain more natural toxicants than normal ones. The reason for the presence of natural toxins is not always known. In some foods, a toxin is present as a naturally occurring pesticide to ward off insect attacks. Or a toxin may be formed to protect the plant from spoilage when damaged by weather, handling, UV light or microbes. Familiar foods can sometimes be unsafe as a result of eating the wrong plant part, improper preparation, inadequate cooking or abnormal eating patterns. While many Canadians know not to eat rhubarb leaves nor potato sprouts, newcomers to Canada may not be aware of the potential danger of some of our traditional foods. Likewise, adventurous eaters who try unfamiliar ethnic foods or plants collected from the wild, first need to learn how to prepare and cook such foods safely. Unusual eating patterns (such as fad diets that put undue emphasis on a single food) may also cause harmful effects if natural toxicants in foods are ingested above safe levels.

Pulses

Many kinds of raw or dried beans and lentils contain a harmful toxin called lectins (Phytohaemagglutinin) that may cause an upset stomach. The highest concentrations are in red and white kidney beans and soybeans. Lectins are destroyed by soaking the beans for at least five hours and then boiling them briskly in fresh water for at least 10 minutes. Do not cook beans at a low temperature, as it may not destroy the toxin. Improperly cooked beans can be more toxic than raw ones. Canned beans can be used without further cooking.

Raw lupini beans contain a harmful toxin called alkaloids that may produce symptoms of dizziness, dry mouth and vomiting when ingested. Alkaloids can be dissolved in water. A minimum of 7 days soaking is required for lupini beans and the water should be changed daily. After soaking the beans may be cooked until soft.

Rhubarb

Rhubarb leaves contain a harmful toxin called oxalic acid and anthraquinones that can cause severe poisoning and kidney damage which may be fatal. Therefore, do not eat the leaves; the stalks are the edible part of the plant.

Cassava

Cassava is also known as yucca, tapioca (a processed product of cassava), gapelek or manioc. Cassava contains a naturally occurring toxin called cyanogenic glycosides in raw or unprocessed cassava that may cause breathing difficulties, staggering, paralysis which may be fatal. To avoid exposure to this toxin, peel and slice the

cassava and then cook it thoroughly, either by baking, boiling or roasting. Frozen cassava, and frozen peeled cassava should also be prepared in this way.

Bamboo Shoots

Bamboo shoots, a traditional ingredient of Asian cuisine, are sourced from the underground stems of the bamboo plant. Bamboo shoots contain a naturally occurring toxin called cyanogenic glycosides that can lead to exposure to hydrogen cyanide and its related toxicity. Fresh bamboo shoots should be sliced in half lengthwise; the outer leaves peeled away and any fibrous tissue at the base trimmed off. The remaining fresh shoots should then be thinly sliced into strips and boiled in lightly salted water for eight to ten minutes.

Fruit Pits, Seeds and Twigs

Peach, apple, cherry, plum, apricot seeds, shoots or twigs contains the glycoside, amygdalin which on hydrolysis yields hydrogen cyanide. Therefore, eat only the fleshy part and skin of fruit, raw or cooked.

Comfrey Leaves

Comfrey leaves contain toxic alkaloids whose long term concern may cause cancer. Therefore, do not eat them.

Bracken Ferns

Bracken ferns contain thiaminase, a substance which destroys thiamine (Vitamin B1). Therefore, do not eat bracken ferns; ostrich ferns (fiddleheads) are safe to eat.

Potatoes

All potatoes contain natural toxins called glycoalkaloids. The levels are usually low but higher levels are present in potato sprouts, the eyes, the peel and where there is green coloration. Glycoalkaloids produce a bitter taste that causes a burning sensation in the mouth and can cause stomach upset, vomiting and headaches; they may also cause death. Glycoalkaloids are not destroyed by cooking, so it is important to avoid eating the sprouts and to remove any green or damaged parts before cooking. Do not eat cooked potatoes that still taste bitter. Remember to store potatoes in a dark, cool and dry place.

Kumara

Kumara is a member of the sweet potato family which can produce toxins in response to injury, insect attack and other stress. The most common toxin associated with kumara is ipomeamarone, which produces a bitter taste when eaten. There have been reports of deaths among cattle that have eaten moldy kumara. The highest levels of toxin are usually found near areas of the vegetable that are damaged. Therefore, it is recommended to remove any damaged parts on kumara before cooking. Do not eat it if it tastes bitter after cooking.

Parsnips

Parsnips commonly contain a group of natural toxins called furocoumarins which are produced in response to stress. The highest levels of toxin is usually found in the peel or around damaged areas. One of the furocoumarin toxins can cause stomach ache and may also cause a painful skin reaction when contact with the parsnip plant is combined with UV rays from sunlight. Peeling the parsnip and removing any damaged areas is recommended before cooking. The levels of toxin are reduced when the parsnip is cooked by baking, microwaving or boiling. Discard any cooking water.

Zucchini

Zucchini may occasionally contain a group of natural toxins known as cucurbitacins which give zucchini a bitter taste. Bitterness in wild zucchinis has been known for a long time but is rarely found in commercially grown zucchinis. Eating bitter zucchinis have caused people to experience vomiting, stomach cramps, diarrhea and collapse. Do not eat zucchini that have a strong unpleasant smell or taste bitter.

Health Canada's Food Guide

It is important that you include a wide variety of fresh fruit and vegetables in your diet. Eating fresh fruits and vegetables reduces the risk of serious health problems such as heart disease, cancer, diabetes and obesity.

Health Canada recommends that adults eat at least 7 to 8 servings of fruits and vegetables each day. It is suggested to choose at least one dark green and one orange vegetable each day to obtain enough of the vitamin folate and vitamin A. Dark green vegetables include arugula, broccoli, chard, dandelion greens, gai lan, kale/collards, mustard greens, and salad greens including romaine lettuce, spinach or mesclun mix. Orange vegetables include carrots, sweet potatoes, squash, pumpkin or yams. Apricots, cantaloupes, mangoes, nectarines, papaya and peaches also contain vitamin A and can replace an orange vegetable.

A pulse is an edible seed that grows in a pod. Pulses are a great source of protein for vegetarians, but they are also a very healthy choice for meat-eaters. Pulses include the whole range of beans, peas and lentils. Pulses count as one of the variety of at least 7 portions of fruit and vegetables we should be aiming to eat each day (3 heaped tablespoons of pulses = one portion). But pulses can only make up a maximum of one portion a day. This is because we need to eat a variety of fruit and vegetables to obtain all the nutrients we need.

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For more information on Natural Toxins in Fruits and Vegetables or other Food Safety topics, please call the Food Safety Network toll-free at 1-866-50-FSNET (37638) or visit www.foodsafetynetwork.ca

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