

## Food Safety Hazard: Alkaloids



### Characteristics/description

Many plants in the potato family (Solanaceae) contain glycoalkaloids. These natural toxins are produced by plants as a defense against animals, insects and fungi that might attack them. They are toxic steroidal glycosides, and the types most commonly found in food plants are  $\alpha$ -solanine and  $\alpha$ -chaconine, with  $\alpha$ -solanine being the more toxic of the two.

### Source

Potatoes that have been exposed to light in the field or during storage may turn green due to an accumulation of chlorophyll. This greening makes glycoalkaloid production more likely. The greening may affect only the surface (peel), or it may extend into the flesh of the potato. Exposure to light is only one of the stress factors affecting potatoes. Other pre- or post-harvest stress factors are physical damage such as cuts or bruises and improper conditions for storing potatoes that promotes rotting or sprouting. Cooking (i.e. baking, boiling, frying, microwaving) does not significantly reduce the levels of glycoalkaloids in foods.

### Effects on humans

Most cases of suspected potato poisoning involve only mild gastrointestinal effects such as nausea, vomiting and abdominal cramps. Glycoalkaloids are associated with a bitter taste and a burning sensation in the throat.

### Incubation

Gastrointestinal illness generally begins within 8-12 hours of ingestion.

### Treatment for patients

The treatment for solanine poisoning is replacement of fluids and lost electrolytes; anticonvulsants (diazepam or paraldehyde) may also be needed.

### Key links

Food and Agriculture Organization:  
"Toxic Substances and Antinutritional Factors,"  
<http://www.fao.org/docrep/t0207e/t0207e08.htm>

### Risk reduction strategies

- Store potatoes in a cool, dry, dark environment to minimize glycoalkaloid formation. Use opaque packaging.
- Discard damaged or green potatoes or cut away any parts of a potato that show signs of greening, physical damage (cuts or bruises), rotting or sprouting.
- Peel the skin from potatoes to reduce glycoalkaloid levels, although if the potatoes are very high in glycoalkaloids, peeling may remove no more than 35 percent, as diffusion into the deeper tissues occurs at higher concentrations.
- Do not assume that the concentration of glycoalkaloids in a potato has decreased if the green color diminishes after storage in a dark environment.
- Avoid the consumption of potato sprouts, flowers, and the area around the "eyes."
- Do not eat raw or cooked potatoes that taste bitter or cause a burning sensation in the mouth.