COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF ALASKA FAIRBANKS

Greening of Potatoes

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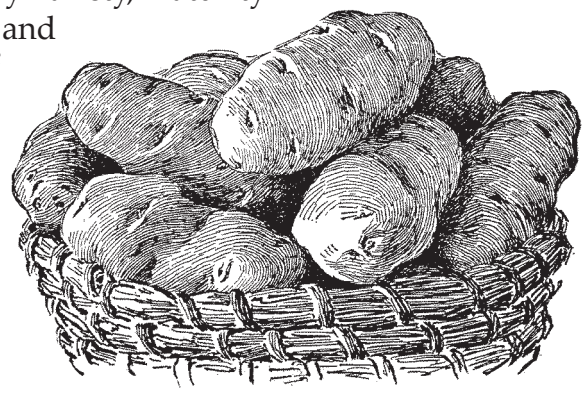
Concern about the potential toxicity associated with eating green potatoes is not unusual. It is important that consumers understand the causes for potato greening. This color change can occur as a result of inadequate soil coverage during the growth stage and subsequent exposure to sunlight or it may be due to exposure to artificial light during storage or while on the retail store shelf.

The green color is caused by the presence of chlorophyll. This is a natural plant pigment which is tasteless and harmless. The tendency toward greening differs among potato varieties. This varietal difference has been found to be especially significant when potatoes are exposed to the artificial light found in retail stores; including storage and sales areas.

The concern with greened potatoes should not be the color but the fact that solanine, a potentially toxic alkaloid, develops in the same area along with the chlorophyll. Green potatoes, therefore, are often higher in solanine than those not green. The bitter taste associated with green potatoes is caused by solanine, not chlorophyll. The amount of greening is not a direct measure of its solanine content, since the synthesis of chlorophyll and solanine are separate processes.

The factors affecting greening of potatoes include more than light exposure. Greening is affected by variety, maturity and age, temperature, intensity and quality of light, and duration of light. White skinned varieties often green more readily than the red or russet varieties. The latter can green also but it may be masked and not as easily detected. Immature potatoes and those recently harvested green more readily



due to lack of a thick outer skin. Potatoes also develop more greening under light exposure, when temperatures are higher, e.g., 68°F versus 41°F. Retail packaging can also contribute to increased greening. Consumers want to be able to view produce prior to purchase. Packaging materials have changed over time from burlap and other opaque materials to transparent bags which allow exposure to light during retail storage and display.

Consumers should be aware that some greening of potatoes is not unusual and may be more prevalent in some varieties than others. Excessive greening should be used as a symptom that solanine may also be present. A bitter taste will verify its presence.

The concentration of solanine is greatest in or directly beneath the peel. Peeling is effective in removing most of the affected tissue. Cooking in steam or water reduces solanine to 60 to 70 percent of the value in raw material.

Growers and retailers should try to reduce factors which contribute to greening. While the potatoes may not develop sufficient solanine to be toxic, the green color decreases marketability and consumer acceptance. Consumers should know that chlorophyll and solanine are natural products produced by potatoes under a variety of conditions. The presence of a green color should be used as a symptom of the presence of chlorophyll (which is harmless) and a signal that solanine may possibly be present. Preventative steps include proper seeding depth, hilling to cover exposed tubers, reducing the time potatoes are exposed to natural light and eliminating exposure to artificial light during storage. Variety choice should also be considered. Control measures including peeling, cooking, and selection of proper home storage techniques.

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