California Science Center

CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)

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J1699

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

The Effects of Light Exposure on Solanine Production in Potatoes

Division

X **Junior (6-8)** _ **Senior (9-12)**

Preferred Category (See page 5 for descriptions.)

16 - Plant Biology

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

Objective: The goal of this project was to find out where potatoes should be stored to discourage solanine production. There are several toxins in potatoes, but the most active one is called #solanine#. A fatal dose of solanine for an adult is 420 mg. Potatoes are checked regularly to ensure they contain less than or equal to 20-mg solanine per 100g of potato. Even so, the amount of solanine in a potato can increase greatly after purchase for various reasons, including exposure to light and aging. #Greening# and #sprouting# both may indicate an increase in solanine, although greening and sprouting are not direct measures of solanine. #The project asked, which will trigger a greater level of solanine production: sunlight from a window, fluorescent light or darkness? #The hypothesis was that potatoes in both types of light conditions would develop more sprouts and green spots than those in the dark.

Procedures: Ten each of red, white and russet potatoes were placed in three boxes (a total of 90 potatoes). The boxes were then placed under a fluorescent light, left near a western exposure window, or left in the dark. The potatoes were exposed to the light for nine hours a day for six days. #Greening#, #sprouting# and length of eyes were measured daily.

Results: Russet potatoes in the dark had a significantly greater numbers of large sprouts than either red or white potatoes. White potatoes and russet potatoes in sunlight exhibited the most greening. Both white and russet potatoes had more green spots than the red potatoes. No matter where the three types of potatoes were store, they exhibited either sprouting, #greening# or both sprouting and greening

Conclusions: The results suggested that anywhere potatoes are stored they may produce solanine! Ultimately, to avoid excess solanine consumption, potatoes should be eaten soon after purchase or peeled if they are older (or discarded).

Summary Statement (In one sentence, state what your project is about.)

The goal of this project was to find out which lighting conditions for storage would best discourage the production of the toxin solanine in potatoes.

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

My mother helped me by letting me use the kitchen, pantry and laundry room to store my potatoes.