



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

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Project Title
What Causes the Most Vitamin C Loss: Water Solubility or Heat?

Abstract

Objectives/Goals
The objective is to determine if it is water solubility or heat that causes the greatest loss of Vitamin C while boiling potatoes.

Methods/Materials
Peeled and sliced potatoes were collected into 100 gram groups. The potatoes were then prepared by boiling, baking at 100 degrees Centigrade or soaking them in a bowl of room temperature water for 15, 30 or 45 minutes. Notice that baking degrades Vitamin C by heat while soaking degrades vitamin C due to water solubility . Also note that boiling involves both heat and water solubility. To test for Vitamin C the potatoes were liquefied and diluted to a fixed volume of 1 cup. They were then titrated at intervals of 0.1 ml into an iodine and starch indicator solution until the solution color changed from blue to gray. Each measurement was repeated 2 additional times.

Results
This table shows the volume of potato mixture that is required to turn an indicator solution from blue to grayish clear.

Time:	15min.	30min.	45min.
Soaking:	0.96,	1.33,	1.83
Baking:	1.33,	1.46,	1.53
Boiling:	1.36,	3.36,	3.70

Conclusions/Discussion
The data showed that baking and soaking produced comparable losses in Vitamin C . I can further determine that it is the interaction between heat and water solubility that causes boiling to diminish so much of the potatoes Vitamin C. I was able to deduce this as the sum of the Vitamin C loses from soaking and baking is less than the loss while boiling alone.

Summary Statement
What factor causes the greatest Vitamin C degradation of potatoes while boiling.

Help Received
None.