



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> Maya R. Wilson	<b>Project Number</b> <b>J1517</b>
<b>Project Title</b> <b>Thermotherapy: A Hot Solution to Keep Your Produce Fresh</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Thousands of pounds of produce are thrown away each day due to molding. The objective of this experiment is to determine if thermotherapy, the process of immersing produce in hot (but not boiling) water, increases its shelf life by killing mold spores, thus delaying molding and keeping the produce edible longer. I wanted to find the best thermotherapy time/temperature combination to keep produce mold-free for as long as possible.</p> <p><b>Methods/Materials</b> I tested the effects of thermotherapy on five types of produce: blueberries, blackberries, raspberries, lettuce, and small sweet peppers. To determine the best time/temperature combination for each type of produce, I immersed them into three different water temperatures: 110°F, 130°F, and 150°F, for two different amounts of time: 30 seconds and 120 seconds.</p> <p><b>Results</b> Based on my experiments, the best Thermotherapy temperature/time combinations to delay mold are: Blackberries 150°F @ 120 seconds    Raspberries 150°F @ 120 seconds Sweet peppers 130°F @ 120 seconds    Blueberries 130°F @ 120 seconds Lettuce 110°F @ 120 seconds</p> <p><b>Conclusions/Discussion</b> My initial hypothesis that thermotherapy will improve the shelf life of produce by killing mold spores and delaying the molding process proved to be correct. However my specific hypotheses regarding the best temperature/times were not accurate. In testing all five types of produce, the longer immersion time (120 seconds) did significantly better than the shorter immersion time (30 seconds). The lettuce did better in cooler temperatures (110°F) while blackberries, raspberries, blueberries and sweet peppers did better in warmer temperatures (130°F to 150°F). I believe the lettuce needed the cooler temperature because at higher temperatures it wilted badly. The blueberries and sweet peppers, despite being smoother and thicker-skinned than the raspberries and the blackberries, stayed fresh longer using a cooler temperature (130°). The blackberries and raspberries needed the highest temperatures to prevent mold growth; this might be because they have softer/bumpier surfaces and they need warmer water to penetrate the surface. From my research, I learned that thermotherapy has been used by commercial growers for many years, but the public knows little about it. I hope my project will increase public awareness and give new insight into the best time/temperature</p>	
<b>Summary Statement</b> The objective of this experiment is to determine if thermotherapy, the process of immersing produce in hot (but not boiling) water, increases its shelf life by killing mold spores, thus delaying molding and keeping the produce edible longer	
<b>Help Received</b> mother bought materials and helped with editing and board.	