



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Younji Youn</b>	<b>Project Number</b>  33751
<b>Project Title</b> <b>What Is the Best Way of Protection that Prevents the Fruits in Refrigerator from Withering?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective was to decide which of the protective materials is more effective at preventing the over-ripening of tomatoes.</p> <p><b>Methods/Materials</b> 27 tomatoes were divided into 3 groups with 3 specimens each for a control group and wrapping two different protective material; newspaper and plastic wrap. The specimens were stored in the same container of a refrigerator for 14 days, and chroma/weight were measured every 3 days, firmness/sugar content every 6 days. Weight was measured with a kitchen scale, chroma with program 'ImageJ' (Optical density analysis), firmness with a durometer (Hardness Tester A), and sugar content with a refractometer.</p> <p><b>Results</b> The control group's weight steadily dropped by approximately 1.1 gram, and the weight of tomatoes in newspaper dropped by 1.4 gram; but the weight of tomatoes in plastic wrapper only declined by about 0.25 gram. The chroma changes in plastic-wrapped tomatoes broke the same pattern of rise and fall of optical density (The rise and fall was the expected result, after watching time-lapse video of tomato rotting) shown in control and newspaper-wrapped group. The data of firmness was inaccurate because of its dependence on amount of pressure experimenter provides, and the data of sugar content could not also be mentioned as evidence because the effect of enzyme on increase of fructose didn't show obvious changes over the short experiment period.</p> <p><b>Conclusions/Discussion</b> The tomatoes wrapped in plastic wrap proved to stay fresh longer than those in newspaper. The results were against my hypothesis, through which I predicted that plastic wrap, being tighter than newspaper, would create small-scale greenhouse effect on produced enzyme and quicken the ripening process. According to additional research, plastic wrap is effective at preventing the oxidation, which is another key factor of ripening besides the enzyme. Longer experiment period might have proven the ultimate way of protection which delays both major factors of ripening. Although there are many more possible ways of prevention of over ripening such as the use of chemicals, my project result might be useful in any places where fresh produces are stored post-harvest.</p>	
<b>Summary Statement</b> My project is about the delaying of over-ripening of tomatoes achieved by protective materials, displayed by features such as chroma, weight, firmness, and sugar content.	
<b>Help Received</b> My father helped planning my experiment, taking pictures for analyzing optical density, recording the data, and creating the graphs and the board.	