



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

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Project Title Chemical Detection Applied to Formaldehyde as a Marker for Wider Chemical Contamination	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Formaldehyde is a known hazardous compound and a human carcinogen. Over the last few years, it has been found in household goods such as furniture and textiles. The harmful nature of formaldehyde will be demonstrated in the growth of bean plants. The potential levels of formaldehyde in food packaging may be high enough to be concerned about. Food packaging is made from a wide variety of papers and plastics as well as printing inks. If formaldehyde is found, it could be a marker for the presence of other chemicals.</p> <p>Hypothesis There will be a detectable amount of formaldehyde in the range of food packaging and textiles, domestic and imported, that are tested.</p> <p>Methods/Materials A variety of food packaging was tested to see if there was a detectable presence of formaldehyde. Over fifty samples were collected from a large range of packaging, both from the USA and imported from multiple countries. A method involving a chemical detector was used to take a quantitative color reading. If any packaging tested positive for the presence of formaldehyde then it was retested. Bean seeds were exposed to formaldehyde and the growth of each bean plant was measured in centimeters.</p> <p>Results Positive samples showed a range of amounts of formaldehyde. Overall, 14.2% of samples tested were positive. None of the ten bean seeds given formaldehyde germinated.</p> <p>Conclusions/Discussion As was hypothesized, there was a detectable amount of formaldehyde in sampled food packaging. This quantitative, color based formaldehyde test can be used as a marker to determine the presence of other hazardous chemicals in food packaging and household items. Further testing could determine what level of formaldehyde is toxic, and whether formaldehyde leaches into foods. In the future, testing for formaldehyde can be broadened to a larger sample size and different household items. Since studying food packaging is a surprisingly new area, this work can be built upon, with testing for a range of other chemicals. More testing for the effects of chemicals at low levels, but in combination could also be done.</p>	
Summary Statement A variety of food packaging and clothing was tested for the presence of the known carcinogen formaldehyde, demonstrating a new concern for food safety.	
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