



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

Name(s) Rayyan T. Talukdar	Project Number J1426
Project Title Bamboo to Use: Making It 100% Biodegradable	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project is to find a disposable spoon that is 100% biodegradable in natural environment, such as, garden soil. I hypothesize that bamboo spoons will degrade the fastest among all other biodegradable spoons (wooden, bio-polymer, cornstarch & wheat straw) as bamboo is a natural product.</p> <p>Methods/Materials For this project I bought all types of biodegradable spoons that were available in the local markets and online. I had Birch wood (6 count), bio-polymer (6 count), cornstarch (6 count), wheat straw (4 count), bamboo (6 count) and plastic (6 count) as my control. I made the bamboo spoons myself. The experimental procedure was as follows: I weighed all spoons and recorded their weights in my notebook. Then, I put each spoon under garden soil. I took out the spoons after a month, washed them, dried them and weighed them. I repeated these steps for all spoons on days 60, 90 and 120. I calculated the loss of weight of each spoon from day 1 to day 120. I calculated the percent weight loss or percent degradation for each the spoon and recorded them in my data table.</p> <p>Results The data show that after 4 months under garden soil, the bamboo spoons degraded most, ~29%, the wooden spoons ~11% and wheat straw ~6%. Corn starch, and bio-polymer spoons had minimal degradation. Plastic did not degrade at all as expected. The results show that my hypothesis was correct. Bamboo spoons degraded most and most likely it will be 100% degraded within 12-14 months under garden soil.</p> <p>Conclusions/Discussion From my experiment I can conclude that even though many commercially available spoons are labeled biodegradable, they are not compostable under garden soil. They need to be degraded in a commercial facility under high heat, high pressure and a lot more moisture. On the other hand, bamboo is a natural product and spoons made of bamboo degraded the fastest under natural conditions. My experiment shows that it would take about 12-14 months for a Bamboo spoon to 100% degrade under natural conditions.</p>	
Summary Statement Bamboo is a natural product and can be used to make 100% biodegradable spoons.	
Help Received I designed my experiment and made the bamboo spoons myself. My science teacher advised me from time to time on how to improve my project.	