



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

Name(s) Alyssa Tang	Project Number J2119
Project Title Testing the Effectiveness of Mycofoam as an Eco-Friendly Packing Material	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this study is to investigate the shock absorbency of Mycofoam, a biodegradable mycelium-based packing material, grown with 3 different variations of ingredients. Styrofoam was used as part of the testing for comparison of the performance of Mycofoam to the standard synthetic packing material.</p> <p>Methods/Materials My project consisted of 2 parts. The first part was growing 3 variations of Mycofoam using the Ecovative GIY (Grow-It-Yourself) kit that contains the dry mycelium (root-like part of the mushroom) and wood hemp materials. I added one of the 3 variations of nutrients (100% flour, 50% flour and 50% cornstarch and 100% cornstarch) to each mixture to grow into a solid piece of packing material in a silicone mold. The second part of my project was testing the shock absorbency of Mycofoam as compared to styrofoam by placing a bag of crackers in between 2 pieces of packing material in a shipping box and dropping them from 3 different heights. The crackers were examined visually for the number of cracks as a way to quantify a value to compare shock absorbency.</p> <p>Results For the low and medium heights, the data collected showed that all the variations of the Mycofoam had no cracks so they were just as shock absorbent as the styrofoam. At the highest height from the top of the stairs of the second floor, styrofoam outperformed Mycofoam. For the variations of Mycofoam, the one grown with 100% cornstarch had the least number of cracks in the crackers therefore it was the most shock absorbent, followed by the combination of cornstarch and flour and the least shock absorbent one being the one with 100% flour.</p> <p>Conclusions/Discussion Mycofoam protected the crackers just as well as styrofoam when dropped from the low and medium heights. The shock absorbency of styrofoam was better only when dropped from the top of the second floor. In reality, packages being delivered are not usually dropped from that high up. According to the UPS and FedEx delivery men, even the lowest height I tested is already higher than top shelf to the floor in their trucks. Therefore, for all practical purposes, Mycofoam can be considered a good alternative for packing material.</p>	
Summary Statement My project showed that Mycofoam can be an alternative packing material since all the variations of home-grown Mycofoam protected fragile items just as well as styrofoam from reasonable drop distances.	
Help Received I needed to know where to get dry mushroom material and Ms. Anja Scholze from Tech Museum directed me to Ecovative. My mom supervised the use of the oven during the growing process but I performed all the other steps myself. Mr. Jeff Betts of Ecovative Designs provided advice on growing Mycofoam.	