# Eco-friendly Alternatives to Polystyrene

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Americans today recycle only 6.5 percent of the 33.6 million tons of plastic produced each year. The remaining plastic is thrown into landfills and takes an average of 450 years to decompose. Additionally, most of the plastic produced is used in packaging and discarded after a few short minutes by most people. According to a study done by Roland Geyer, an industrial ecologist at the University of California, most packing plastic is thrown away in the same year, in fact, less than thirty percent of plastic ever produced is still being used. The other seventy percent is simply dumped into landfills. Arguably, one of the most harmful of these plastics is Polystyrene (most commonly used to produce cutlery) because it takes over 500 years to begin decomposition. In addition to this, Polystyrene is known to contain BPA (bisphenol-A) which is a toxic chemical used to make commercial plastic products. Overexposure to BPA is known to be linked to many health issues like infertility, birth defects, increased blood pressure and heart disease. We worked to find alternatives to polystyrene that were BPA free and didn't damage the environment while simultaneity being structurally comparable to polystyrene. The plastics we made and tested were made from algae, casein, gelatin, or starch. The plastics were made by compressing polymers into spoon molds and then being left to dry for multiple days. After which they were tested for melting point, decomposition time, tensile strength, and shrinkage. These results were compared with the results of polystyrene and a hybrid between the casein and starch was later made that was able to outdo polystyrene in all but one test ( shrinkage)

**Awards Won:**
Arizona State University: Arizona State University Intel ISEF Scholarship