

The Hippies
WRIT 120.001
Professor Bailey-Hartsel

Scientific Summary

Summary: In order to detect GMOs in foods, our STEM Writing 120 class conducted an experiment that could test food products for GMO DNA. We had five groups total, each testing a different corn-based food. For our group's experiment, Group D, we tested Carmike Movie Theater popcorn. Group A tested a soft shell tortilla, Group B tested Honey BBQ Fritos, Group C tested Tostitos Tortilla Chips, and Group E tested Nacho Cheese Doritos. Group A found that they had two GMO corn products. Groups B,C, and E found one GMO in their foods. Our group was unsuccessful in finding any GMOs, or even any plant DNA at all, so our results were ruled inconclusive.

Problem: GMOs are raising concerns among many people. They want to know what foods have GMOs and whether or not they are safe. We conducted this experiment so we would be able to say what kinds of foods have GMOs, however, we have no way to prove if they are safe or not; there is just not enough data and research that has been done. This experiment was done simply to inform people on what foods they may be eating that contain GMOs.

Methods: To begin, we weighed out 1.02 grams of popcorn and placed it in the mortar and pestle. Then, we added 5 milliliters of water and began crushing the popcorn. 5 milliliters was not enough, so we added another 5 milliliters to get the slurry we were looking for. We repeated this process with 1.2 grams of certified non-GMO oats that acted as our negative control. When both of the slurries were ready, we filled the tip of our pipette with our popcorn slurry and another pipette with our oat slurry. Then, we placed each liquid in a tube with Instagene, which is needed to extract any possible DNA. Now, with our two tubes, we put them in Styrofoam blocks. This way they would float when we heated them in 95 degree Celsius water for 5 minutes. When the 5 minutes were up, we removed the tubes from the water and placed them across from each other in the centrifuge where they spun for 5 minutes. At this point, we were done for the day, and our tube of popcorn and tube of oats were placed in a refrigerator until we returned to finish the experiment.

On day two of the GMO experiment, we put together six test tubes. The first two tubes contained the popcorn. The second two tubes contained the oats and the last two tubes contained a liquid with positive GMO DNA. Now that the test tubes were ready, we put 20 micro liters of red GMO primer in tubes 1,3, and 5, and 20 micro liters of green plant primer in tubes 2,4, and 6. The primer is needed so ribosomes can cling to DNA to help produce more DNA. To assist the primer, a master mix is added that contains ATP, GTP, TTP, and CTP to help build DNA strands. Now that all of our tubes are ready, they are placed in the PCR machine so the DNA, if there is any, can be created, duplicated, and interpreted.

The gels that our popcorn produced did not have a marking in the column that would have a mark had there been a GMO. However, it turns out that our results were

inconclusive because the PCR was unable to pick up any form of plant DNA. This could be due to an error in lab, or the fact that the large sum of heat need to make the popcorn destroyed any DNA that there could have been, hindering us from finding any results.

Data and Results

Group	Food Product	Does it have GMOs?
Group A	Chipotle Soft Shell Tortilla	Yes; 2 GMO sources
Group B	Honey BBQ Fritos	Yes
Group C	Tostitos Tortilla Chips	Yes
Group D	Carmike's Buttered Movie Theater Popcorn	Inconclusive Results
Group E	Nacho Cheese Doritos	Yes

Conclusion: After doing this experiment, our class had found a number of GMOs in our selected corn-based products, such as Chipotle soft shell tortillas, Honey BBQ Fritos, Tostitos tortilla chips, and Nacho Cheese Doritos. However, we are unsure if Carmike popcorn contains GMOs due to the fact that we were unable to obtain plant DNA from the product, which could be because the DNA was destroyed in the popping process, or because of possible lab contamination. If we wanted to further this study, we would try popcorn that has not been popped yet, and try different types of popcorn. There was also no way to tell the amount of GMO products in each product, so we would do a study and conduct an experiment that would give us specific amounts of GMOs in each tested food. Hopefully these would clarify our results so we would end up with good data, instead of inconclusive results.