CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

35169

Project Title

The Time Dependent Effects of Humidity on Tortilla Chips

Abstract

Objectives/Goals

My experiment was designed to demonstrate the time-dependent effects of humidity on tortilla chips. My hypothesis was that humidity is a leading cause of decreasing crispness or increasing staleness of chips.

Methods/Materials

To test this theory, I created a dry environment using desiccant in a sealable plastic container, a humid environment using evaporating water in another container, and an uncontrolled #household# environment. Temperature and other conditions were the same for the three containers. I sealed test chips in the dry and humid containers and placed chips in the open #household# container. I used humidity loggers in each of these environments. I defined crispness as the number of pieces a chip breaks into when hit by a fixed impact. Fresher, crispier chips break into more fragments. Using chips exposed to these three environments, I measured the crispness of chips over time by dropping an empty plastic bottle down a PVC pipe onto test chips, and I would count the number of fragments above a certain size. I plotted average counts versus time for each of my environments.

Results

The dry environment preserved the crispness of chips. The humid and household environment turned the chips stale, as measured by statistically significant declines in the number of broken chip fragments over time. The humid environment turned the chips stale at a faster rate than the household environment. In a preliminary test, I demonstrated that temperature was likely less of a factor by testing dry chips placed in a freezer. There was no statistically measurable change in crispness compared to room temperature dry chips.

Conclusions/Discussion

My hypothesis was demonstrated because the dry chips retained their crispness, while high humidity rapidly made chips less crispy.

Summary Statement

My project demonstrates the effects of humidity and the reduction it causes on the crispness of a chip over time.

Help Received

My father was my advisor in the project and also proofread my work.

Preliminary