



CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

Name(s)

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Project Number

35363

Project Title

Jail Break: Can Acidic Foods Corrode Metal?

Abstract

Objectives/Goals

The objective of this experiment was to see if it was possible to use common acidic food substances to deteriorate metal cell bars as a possible escape method from prison. I believe that foods with the lowest pH levels will be the most effective at corroding metal bars such that it could be used as a method to break out of jail.

Methods/Materials

A 36 inch long metal bar with a 0.75 inch diameter was cut into fourteen pieces, each two inches long. The metal bars were doused (but not submerged to allow air to reach the metal) with six different acidic food substances. The food substances were lemon juice, cranberry sauce, vinegar, tap water, salsa and dill pickle juice. The coated bars were stored in plastic containers for a six week period. Two metal bars were not exposed to any substances as the control. Once a week the bars were wiped clean with paper towels and weighed. The food substances were refreshed each week.

Results

It was discovered that all six substances caused the metal bars to corrode though vinegar was by far the most effective and in most cases the more acidic foods deteriorated the metal at a faster rate than foods with a higher pH level.

Conclusions/Discussion

Based on the results, it was concluded that a prisoner could coat his cell bars in acidic foods as a possible escape plan.

Summary Statement

The purpose of this project was to see if food that could be found in a prison cafeteria could be used to corrode metal cell bars as part of a prison escape plan.

Help Received

Father supervised sawing metal bars. Mother showed me how to make excel graphs. Parents proof-read my write ups.