



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Malia A. Packer	Project Number J0408
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Project Title
Dazed by a Taze: An Examination of the Effect of an Electrical Control Device on Human Cell Salts and Proteins

Abstract

Objectives/Goals
My father is a police officer so I know that there are a lot of law suits that claim a Taser can do serious or lasting harm to a person. Some lawsuits claim that a Taser discharge is a form of deadly force. I decided to test whether there are long term effects on human protein as well as the conductivity of the salts in human tissue by testing similar solutions outside the body. My goal was to create saline solution samples and protein samples, subject the samples to a measured electrical discharge and record any changes in conductivity and protein structure.

Methods/Materials
I created a distilled water control sample. I also created five saline solution samples that closely replicate the salts in a human cell using distilled water and a product named Instant Ocean. I created five protein samples using the egg whites from ten grade AA eggs.

I used a conductivity meter to measure the conductivity of the control sample, saline solution samples, and protein samples before, immediately after and ten minutes after a 5 second Taser (electrical) discharge.

I used a YSI 30 Conductivity meter, 200 and 250 ml beakers, a Thermo-tech digital thermometer, a Sartorius Balance, a Taser X26 with probe cartridge, egg whites, Instant Ocean (cell salts), and distilled water.

Results
All of the samples showed an immediate increase in conductivity. After 10 minutes the conductivity of the saline solution returned to ~2.63 mS on average from the original conductivity. After 10 minutes the protein samples returned to ~.31 mS on average from the original conductivity reading.

Conclusions/Discussion
I originally thought that the electrical discharge would cook the protein samples. There was, however, only a small amount of denaturing in the protein samples. This suggests that there would be minimal denaturing to human tissue protein. I was correct in my belief that there would be no permanent, long-term damage or change to human cell salts.

Summary Statement
An examination of the effect of an electrical control device (Taser) discharge on human cell salts and proteins.

Help Received
Laboratory equipment and materials at Humboldt State University were provided by Dr. Terry Jones and Dr. Dustin Poppendieck. I worked in the HSU engineering laboratory under the supervision of Colin Wingfield. Tasers were provided by Humboldt County Correctional Facility and Taser International.