



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

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| Name(s) Toni D. Bronars | Project Number J1705 |
| Project Title The Effects of Salt on Drosophila: Does a Tasty Diet Take Its Toll? | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project is to learn if tasty levels of salt harm the health of mature <i>Drosophila melanogaster</i>. This was tested through cold stress and lifespan tests.</p> <p>Methods/Materials 300 wingless <i>Drosophila melanogaster</i> (aged 2-11 days old) were placed on three diets, high salt (containing 3 additional grams of salt per 200 ml of food), medium salt (containing 1.5 grams of additional salt per 200 ml of food) and low salt (containing negligible amounts of salt from the bananas in the food). These salt levels are ones larval fruit flies find appetizing. These flies were left on their specified diets for their entire lives and the number of surviving flies in each group was counted and recorded each day. Three stress tests were conducted with around 300 <i>Drosophila melanogaster</i> per trial. The flies were placed on the specific diets for five days and then brought to 2°C for 12 hours. The flies were removed from the cold and after 30 minutes, and the number of mobile flies was recorded. In total, 325 flies in the high salt group, 322 flies in the medium salt group, and 315 flies in the low salt group were stressed.</p> <p>Results The average lifespan of flies after being placed on a high salt diet was 12 days. For the flies on the medium and low salt diets, the average lifespan was 18 days on the diets. The flies used in the longevity test were separated into males and females. By day 21 on the diets, only 2% of the high salt males still remained whereas 47% of the medium salt males remained and 59% of the high salt males remained. 24% of the high salt, 26% of the medium salt, and 37% of the low salt females were still alive by day 21. The stress tests showed that 39% of the high salt flies, 50% of the medium salt flies, and 59% of the low salt flies were mobile.</p> <p>Conclusions/Discussion This study finds that the lifespan of fruit flies is substantially reduced by a high, but tasty, salt diet. The overall negative effect of salt is almost entirely due to the negative effects of salt on males: females on all three diets had similar survival rates. The effect of a medium salt diet was similar to the effects of a low salt diet for both sexes. The stress tests led to similar conclusions. After stress, medium and low salt mobility was similar while high salt mobility was much lower. This result can be used to infer the effects of a high, but still tasty, salt diet on human beings.</p> | |
| Summary Statement Adult <i>Drosophila melanogaster</i> have a substantially shorter lifespan and poorer responses to stress when on a high, but still tasty, salt diet. | |
| Help Received Erilynn Russo gave me research advice and information on <i>Drosophila</i> . My mom bought my supplies. My dad, mom, and uncle edited and commented on my work. Ms. Rosichan stayed after school and during lunch so I could work under the fume hood. | |