



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

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Project Title Determining the Efficacy of Different Methods to Assess the Level of Dehydration Using Human Saliva	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals After playing sports or exercising, people slowly become exhausted and dehydrated, depending on the amount of water consumption pre-exercise. The purpose of our project is to detect if one is dehydrated by collecting data on saliva using five different tests (volume, area of blot, ketones, pH, and iodine amylase). Based upon reading the literature, our hypothesis is that by using a combination of tests on saliva, we can determine if an individual is dehydrated.</p> <p>Methods/Materials We recruited 10 human subjects who were asked to spit into a graduated cylinder to record their pre-exercise saliva. The subjects completed the predetermined exercise (run on the treadmill to reach maximum heart rate for the person's age). Immediately after, we asked the subject to spit into another cylinder to record the post-exercise saliva. Ten minutes after drinking water, they spit once more to record post-hydration saliva. During that time, we analyzed the post-exercise saliva and measured volume, pH, and presence or absence of ketones, measured the area of the blot on blotting paper, and checked for presence of amylase using an iodine test. For our iodine solution test, we set up 4 micro-centrifuge tubes, and put a small quantity of potato in each. The first tube was our control, as it contained one drop of iodine and no saliva. In the second, we added 1 mL of pre-exercise saliva and a drop of iodine. In the third tube, we added 1 mL of post exercise saliva and one drop of solution. In the fourth tube we added 1 mL of post hydration saliva and one drop of iodine.</p> <p>Results The pre-exercise saliva samples served as the baseline for each of our subjects. Comparing their post-exercise samples to each individual's baseline, we detected a trend in some individuals. We observed the ketones were positive, pH was acidic, blot size and volume decreased, and salivary amylase decreased. After hydration, their levels returned to baseline.</p> <p>Conclusions/Discussion This data supports our hypothesis of determining dehydration using saliva. Testing a larger sample size of human subjects over a longer duration of time would increase the power of this study. This data can be used to support the use of saliva as a medium to assess dehydration in the home, in athletic fields, and in medical settings as a simple and economical method to evaluate one's level of dehydration.</p>	
Summary Statement We aim to determine the efficacy of different tests in assessing the level of dehydration using saliva from young athletes before and after exercise.	
Help Received Parents helped print the slides; the mentor helped edit the abstract; friends served as subjects and provided saliva.	