



CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

Name(s) Mohona R. Ganguly	Project Number J1907
Project Title Measurement of Potassium in Four Varieties of Rice by Atomic Emission Spectroscopy	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment was to determine the amount of potassium in four different varieties of cooked rice. This study was made to assist in the meal plan of a patient with hyperkalemia (excessive potassium in blood) due to advanced kidney disease. I hypothesized that brown rice would contain the most potassium because it retains the bran layer which contains most nutrients compared to white rice which is polished.</p> <p>Methods/Materials To accomplish this, I used atomic emission spectroscopy by working in the Chemistry laboratory of the Occidental College, Los Angeles on 12/04/2015 and at Chandler School, Pasadena on 01/12/16. Three known potassium standards were created and the atomic emission spectrometer (AES) was used to generate a calibration curve. Potassium was extracted by mashing up rice samples, adding dilute hydrochloric acid, followed by continuous stirring and heating. The isolated potassium was filtered out and diluted. Each sample was then run through the AES and compared with the calibration curve to determine the amount of potassium it contained. From the results, potassium in each gram of rice was determined. I then weighed one cup (typical serving) of each type of rice to determine the mass. Combining these results the amount of potassium in each cup of rice was calculated.</p> <p>Results I found that parboiled rice contains the most potassium in one serving and brown rice the least, although the difference between the four different types of rice was not too drastic. Ideally it would be best to choose brown rice for hyperkalemia patients.</p> <p>Conclusions/Discussion As an extension of the experiment I would like to repeat the experiment with other staple foods and build different meal plans for hyperkalemia patients. The sources of errors in this experiment are low due to the fact that the AES instrument is very accurate and the readings are repeated several times in the instrument itself. However, my hypothesis stating that one serving of brown rice would have the most potassium was proven to be incorrect. According to my experimental findings, parboiled rice contains the most and brown rice contains the least potassium in it.</p>	
Summary Statement Using Atomic Emission Spectroscopy I determined Potassium content in four different varieties of rice which would help in the diet plan of a patient with hyperkalemia (excessive Potassium in blood).	
Help Received The idea of the project was my own. I learned Chemistry from Professor Michael Hill. I conducted the experiment at Occidental College, Prof. Hill showed me basics and Dr. Andrew Udit showed me how to run the AES. I also received guidance from Ms Newman and other science faculty at my school.	