



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Justin R. Scott	Project Number J1322
Project Title Down with Diabetes	
Abstract Objectives/Goals I am testing if Body Mass Index (BMI) in non-obese adolescents is related to the rise in blood glucose levels two hours after a high carbohydrate intake. I hypothesize that the adolescents with higher BMIs will have a higher rise in blood glucose levels. Methods/Materials After obtaining informed consent, I interviewed 19 adolescent test subjects regarding family history of diabetes and number of sports played. I obtained height and weight data for calculation of their BMI. They had a fasting fingerstick blood glucose level checked and were given 75 gm of glucose in the form of grape juice. Two hours later, another glucose level was obtained and the difference between the fasting and 2 hr. glucose was recorded. Results The adolescents with a BMI of 21.0 to 24.9 had an average rise in glucose levels of 19.5 mg/dL after the two hour period. Those with a BMI of 19.0 to 20.9 had a rise of 8.0 mg/dl, BMI group of 17.0 to 18.9 had a rise of 12.6 mg/dL, and BMI group of 15.9 to 16.9 had a rise of 9.5 mg/dL. Thus, those with the highest BMI had a rise in glucose level 6.9 to 11 mg/dL greater than the other groups. However, there were some adolescents in the 15.9 to 17.0 BMI group with some large increases in glucose levels. To investigate this disparity, the subjects were grouped by the number of sports each played. The adolescents who played no sports had an average difference in glucose levels of 21.67 mg/dL, those who played one sport averaged 11.3 mg/dL, two sports averaged 5.0 mg/dL, and 3 or more sports had no average change in glucose levels. Conclusions/Discussion The data from my experiment shows that my hypothesis was correct. The test subjects with the highest BMIs did have the highest rise in glucose levels during the glucose tolerance test. Conclusively, those with a BMI over 21 had an average increase in glucose levels of over 19 mg/dL. I also gathered information about the adolescents# family history and physical activity. Unexpectedly, I found there was a strong association between the rise in glucose levels and the number of sports in which they participated. Taken with the BMI data, it can be seen that the adolescents who played the most sports had the healthiest BMI levels and best glucose responses. Therefore, measures to promote a healthy body weight and activity level could have a favorable impact in preventing type II diabetes in adolescents.	
Summary Statement My project showed that BMI in non-obese adolescents is a determinant of glucose response after a high carbohydrate intake.	
Help Received My mother, Denise A. Scott, M.D., supervised and provided the glucose testing supplies; my father helped me with my data graphs on the computer; 19 of my friends and relatives were test subjects for my experiment.	