



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Jasmine Tibayan; Edward Vasquez	Project Number S1215
Project Title The Throw-In Throw Off: A Study of the Correlation between Arm Length, Arm Circumference, and the Distance of a Throw-In	
Abstract Objectives/Goals This project was designed to determine whether an increased arm length and/or circumference (i.e. the distance around the apex of the Biceps brachii and Triceps brachii muscles on the upper arm) provides a measurable distance advantage during a throw-in. We believe that a bigger, longer arm will throw farther than one much shorter and scrawnier. Methods/Materials Informed consent was obtained from 74 people, 37 high school males, one adult male, 34 high school females, and 2 adult females. Each participant's arm length, flexed arm circumference, and relaxed arm circumference were measured and recorded. Each participant then threw three times according to FIFA guidelines; after each throw, the distance was recorded. Results There was no substantial correlation between arm length and circumference vs. the distance of a throw-in. Conclusions/Discussion The data do not support the hypothesis. After analysis, there is no meaningful correlation between arm length and throw distance, or between arm circumference and throw distance. This lack of a relationship is probably due to variables that were neither controlled nor measured including: the small ranges in measured arm lengths and circumferences, body fat, and subject personal motivation. To a soccer player, this signifies that specifically training the arms will provide an advantage	
Summary Statement This project was designed to determine whether or not arm length or the circumference of the upper arm had any effect on the distance of an overhead throw-in in soccer.	
Help Received Parents helped with supplies/logistics; Mrs. Lewis and Mr. Grubb for assistance with analysis; Donald Mathis, for suggesting the measurement method; McKenzie Pantana, for assisting with data analysis	