



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Kerry Anne Haggerty	Project Number J0510
Project Title The Effect of Fat and Protein on Milk Foam	
Abstract Objectives/Goals The objective of this experiment is to investigate the relationship between fat and protein in milk foam and determine the amount of egg white that is needed to compensate for the fat in whole milk and achieve the same foam height as non-fat milk. Methods/Materials Eight different liquid combinations of 3 tsp. were tested including distilled water, skim milk, whole milk, and five mixtures of whole milk and egg white starting with a ratio of 2.5 to 0.5 tsp. and increasing the egg white by 0.25 tsp. every sample. I shook each combination for 40 sec. and measured the foam height at 0, 3, 6, 9, 12, 15, 20, and 30 min. I ran three trials of each sample. Results Neither distilled water nor whole milk produced foam. Skim milk produced the most foam of all the samples. Contrary to my hypothesis, the formula 1.75 tsp. whole milk and 1.25 tsp. egg white created less foam than skim milk, however, it stabilized in a similar way as skim milk. Although the formula 1.5 tsp. whole milk and 1.5 tsp. egg white did not produce as much foam as skim milk, it stabilized to a significantly higher foam height. Conclusions/Discussion My hypothesis that the formula with 1.75 tsp. whole milk and 1.25 tsp. egg white would produce the same foam height as skim milk was incorrect, although that formula stabilized similarly to skim milk. It is not possible to compensate fully for the fat in whole milk using egg white. Experimenting with other additives like lecithin would provide interesting information.	
Summary Statement The experiment investigated fat and protein in creating milk foam to determine whether egg white can compensate for the fat in whole milk and the amount needed to achieve the same foam height as non-fat milk.	
Help Received In class, I learned about the scientific method. My science teacher helped me develop a procedure for my experiment. My parents helped me purchase the materials.	