



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Emmalee M. Barlett	Project Number S0501
Project Title MOO...re from Your Milk: Varying Protein Levels	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective was to find out which milk - whole, reduced fat, or fat free - had the highest protein level and determine if the process of skimming does indeed collect all of the proteins in the milk.</p> <p>Methods/Materials Materials needed for this project are as follows: different milk types # whole milk, reduced fat milk, and fat free milk; hot plates; spatulas; thermometers; beakers; measuring utensils; scale; and protein-level reading kit. To perform the experiment, first measure out the different milk types and pour into different beakers. Heat milk to start process of forming skim. Time how long each milk sample takes to achieve skim while heating. After heating, remove skim from top of milk samples and, through a series of chemical reactions, record the protein colors and temperatures of the skim and the remaining heated milk.</p> <p>Results All of the milks were high in protein before skimming, but after skimming, none of them contained protein. The whole milk had the closest color relationship with the protein reference solution. The hypothesis was proved correct. The average times to skim all milks were all fairly close to each other, being off by only thirty seconds between the three milks. The average skimming temperature was also similar with a range of only six degrees between the three milks.</p> <p>Conclusions/Discussion These results prove that the research and hypothesis are correct. Pediatricians agree that infants and growing toddlers need whole milk for its increased protein levels to help grow strong bone structures and digestive systems. Protein levels will vary in all milks depending on butterfat content and methods for processing. Further research might include the differences in protein levels between homogenized and non-homogenized milks and pasteurized and non-pasteurized milks.</p>	
Summary Statement The protein levels in milk differ from milk type to milk type.	
Help Received Used lab equipment at Standard Middle School under the supervision of Mrs. Ana Williams; Mother helped put together board; Dad took pictures	