



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

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Project Title Got Protein?	
Abstract	
Objectives/Goals To measure the amount of protein in commercial milk products:cow, goat, soy, almond, rice, and coconut.	
Methods/Materials Preparation and analysis: 1. If necessary, dilute each milk product with a volumetric flask (i.e. 1:100) 2. Transfer 100 ul each milk product or its dilution into labeled tubes 3. Prepare a #0# test tube or blank (only buffer) used as a reference to zero the Spec 20 at 595nm. 4. Add 6.0 mL of Coomassie Brilliant Blue reagent into each test tube (n=3). 5. After Bradford reagent added, wait 5 min and read absorbance. 6. Calculate mean \pm SD (n=3) of absorbance values for each milk product and record them in data table. 7. Use equation from standard curve to determine protein in grams. Materials: 1. 8 milk products (four plant and four animal); 2. Coomassie Brilliant Blue G 250 dye; 3. BSA (Bovine Serum Albumin); 4. Spectrophotometer 20; 5. cuvettes or test tubes (for Spec 20); 6. micropipettors and tips; 7. vortex mixer; 8. test tubes (for milk dilutions); 9. test tube rack; 10. 1 standard timer; 11. Permanent Lab Markers; 12. Lab book (i.e. Composition book); 13. 0.1 M KH ₂ PO ₄ (Potassium Dihydrogen Phosphate); 14. 0.1 M NaOH (sodium hydroxide); 15. volumetric flasks (i.e. 10mL, 100 mL, and 1L); 16.deionized water.	
Results Chocolate and skim milk,from cows, had similar measured protein content 5.4 vs 6.3g protein/8oz. Of 3 plant-derived milk products, only soy had a measured protein content similar to animals. Other plant derived products had negligible protein content	
Conclusions/Discussion The general trend of results was: experimentally determined values were lower than values found on assorted product labels; 0.2 g/8 oz serving,and 1.0 g/8 oz respectively.The 83% between these values represents the percent that my values differed from the label. Conclusion: The results support my hypothesis; bovine milk has similar protein content as other animal derived milk products. Of the 3 plant-derived milk products tested, only soy had a measured protein content similar to animals. Other plant derived products (rice and coconut) had negligible protein content. Plant derived milks don't contain a complete protein and #can't be used as infant formula# because they won't support health and normal growth.	
Summary Statement Measure the amount of protein in the top four plant and top four animal milk products in the United States.	
Help Received Neighbor provided posterboard, Dr. Malhotra provided many of my materials and a lab, my Dad assisted (when needed) in the lab and obtained Coomassie Brilliant Blue reagent for experiment, BSA, etc; my Mom proof read most of my papers; my sister gave me support; and my Uncle at AAA chemicals gave me	