



CALIFORNIA STATE SCIENCE FAIR 2007 PROJECT SUMMARY

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Project Title Does Specific Protein Content and Quality in Hot Dogs Affect Price? Analysis of Nine Types	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This study was designed to evaluate what types of proteins make up the protein content in different hotdogs, and to see if variations in protein content and quality affect price.</p> <p>Methods/Materials Hotdogs were sliced, processed in an automated tissue processor, cut into thin sections on a microtome, placed on glass slides, stained and examined under a microscope. All protein seen was marked on the slides by covering the protein with dots using Sharpie pens. Each protein type was dotted with a different color pen. The total number of dots on each slide was counted to evaluate total protein content. Then each of the different colored dots, representing each of the different types of protein, was tallied individually. The percentage of each protein type was calculated. The price per unit weight of each type of hotdog studied was obtained from a major supermarket chain. Results were graphed and compared.</p> <p>Results The types and quality of proteins present varied in each of the nine types of hotdogs as did the percentage of each protein component. Six different types of protein were identified : skeletal muscle (pure beef), collagen, blood vessels, bone, cartilage and nerve. Skeletal muscle, collagen and blood vessel were found in all nine hotdogs tested, bone and nerve in seven and cartilage in three. The price of the hotdogs varied from 21.8 to 39.9 cents per 30 grams. Price was not directly related to the types, quality or amounts of protein present.</p> <p>Conclusions/Discussion There are two major aspects of protein quality - nutritional, which is objective, based on the amino-acid sequences present, and "eating quality" which is subjective, involving factors such as taste and texture as perceived by the consumer. Skeletal muscle is the highest quality of all six proteins in this study, objectively and subjectively. Bone and cartilage which are not well absorbed are the poorest. Since monetary value of a protein is determined by it's quality hotdogs with the most skeletal muscle and the least bone and cartilage are expected to be more expensive than those with less muscle and more bone and cartilage. The results of this study show that the different proteins used in different hotdogs do not directly determine price. Factors such as marketing and brand recognition appear to play an additional role.</p>	
Summary Statement Nine different types of beef franks were examined microscopically to evaluate their protein content and to determine whether variations in protein quality affect sales price.	
Help Received Hotdogs were processed for microscopic evaluation in the anatomic/surgical pathology department of Grossmont Hospital, La Mesa, CA, under the supervision of Dr. Sharon Mair.	