



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

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Project Title Effect of Preservatives on Meat	
Abstract Objectives/Goals The purpose of our experiment is to add certain preservatives to meat, and analyze at differing times whether they will inhibit bacterial growth on the meat. Methods/Materials Preservative of curry paste, garlic, tobacco paste, salt, sugar, mayonnaise, and the control, sterile distilled water, was evenly spread on the surface meat and incubated at room temperature for intervals of 12, 24, and 48 hours. Bacterial colony forming units, CFU, was measured using two different techniques; A. direct swab of sample, and B. 1- hour enriching broth and plating. Zone of inhibition tests were completed. Results The results revealed preservative samples of garlic, tobacco, salt and sugar had the highest degree of inhibition of bacterial growth. Curry powder had the most amount of bacterial growth. The 3 trials showed very consistent and reproducible results. The longer meat was left out at room temperature, the larger the number of bacterial colonies formed. The meat sample treated with salt showed the least amount of bacterial growth. Conclusions/Discussion Direct swab technique and enhanced inoculation technique yielded similar and consistent bacterial inhibition results for the garlic, tobacco and salt samples. Salt acted as the best preservative with the least amount of bacterial growth, while the curry powder proved to be the worst. The turbidity of the inoculated sample tubes were also consistent with the agar plating method. The zone of inhibition study also depicted the salt sample as having the largest zone of inhibition of 2.0 cm versus the control of 0.0 cm . The results of the study also supported the second part of our hypothesis that keeping meat at room temperature longer drastically increased the bacterial growth on the meat. The salt samples inhibited the bacterial growth by altering the water balance of the bacterial cell and its environment. The salt preservative dehydrated the bacterial colonies it contacted. Curry sample exhibited the highest degree of bacterial colonization at all time intervals. The curry sample may have a microbial enhancing effect when added to meats and left out at room temperature.	
Summary Statement Our experiment involved the scientific method of microbiological analysis of bacterial inhibition of preservatives on meat.	
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