



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Sarah D. MacEachron	Project Number J1317
Project Title Does Fat Content Affect Spoilage Rate of Milk?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to determine if the fat content of milk affects the rate at which it spoils. I was specifically interested in harmful bacteria multiplying in milk because my idea originated after I got food poisoning from milk left out at a hotel buffet. My hypothesis was that the higher the fat content of milk the more nutrients there would be for the bacteria so they would reproduce in greater numbers.</p> <p>Methods/Materials I used the chemical Methylene Blue as an indicator of how many bacteria were in milk. Upon adding Methylene Blue to samples of milk with 5 different fat contents, the milk turned dark blue. As bacteria multiplied and metabolized, using up oxygen, the milk gradually turned back to its normal color. I invented a color rating system to record color changes every four hours.</p> <p>Results My hypothesis proved generally correct. Comparative growth of the different milk fat content samples indicated that milk with a higher fat content allowed for bacteria to multiply in greater numbers. My data showed an abnormal result for 2% milk, which I believe was due to other factors such as possible pre-contamination of that particular milk sample.</p> <p>Conclusions/Discussion In conclusion my results indicated that milk with higher fat content allows bacteria to produce in greater numbers. I have learned that there are many factors that influence bacterial growth in milk, including ph level, oxygen availability, temperature, and the initial concentration of pasteurization-surviving bacteria. My experiment has contributed the factor of bacterial food supply in the form of the fat content in milk. If these results can be replicated in other experiments, the conclusion that milk fat is associated with higher bacterial growth may be useful for preventing illness and milk preservation.</p>	
Summary Statement This experiment tested whether milk fat affected the bacterial concentration in pasteurized milk, finding that the higher the fat content the more nutrients bacteria can use to grow.	
Help Received Mother supervised work with chemicals and helped glue pages on board.	