



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Meg C. Dadourian	Project Number J0404
Project Title Fundamentals of Fermentation	
Abstract Objectives/Goals "How does changing the temperature affect how long it takes Chinese cabbage to ferment into kimchee reaching a pH of 3.5?" It is hypothesized that the kimchee in the 32o C will ferment faster than the kimchee in 21 o C or at 4 o C. Methods/Materials Approximately equal amounts of Chinese cabbage, salt, garlic and chilly powder were placed in 15 sterilized containers. Then, five containers are placed in environment with a temperature of 4 o C; five containers were placed in environment with a temperature of 32o C; and five containers were placed in at room temperature of 21 o C. At approximately 12-hour intervals, the pH level was measured. Once the pH level dropped to 3.5 the experiment was complete. However, the last recording of the pH level was taken after 372 hours even if a pH level of 3.5 was not reached. Results The results supported the hypothesis. Conclusions/Discussion It is recommended that if this experiment was to be repeated that prior to extracting sample juice, the contents of each jar should be thoroughly mixed to make sure that all the juice represents the actual overall pH level in the jar. Also, a chemically non-reactive weight should be placed in all the trials to ensure that the juices completely cover the cabbage at all times ensuring an anaerobic environment.	
Summary Statement How does changing the temperature affect how long it takes Chinese cabbage to ferment into kimchee reaching a pH of 3.5?	
Help Received My parents assisted me with purchasing the materials and cutting the cabbage and general supervision. Mrs. Hoffman, my teacher, helped me with organization of the project. and Dr. Daub, Chairman Chemistry Department, Harvey Mudd College, for his consultation on my science fair project.	