



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

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Project Title Yeast Past Its Code Date: Has It Really Expired?	
Abstract Objectives/Goals The goal of this experiment was to find out if yeast, past its code date, was still viable. Live yeast digest sugars and produce carbon dioxide as a byproduct. Methods/Materials In this experiment, samples of 3.5 grams of yeast with 70 grams of sugar and 240 mL of 40° C water were mixed well in a #Ziploc# bag. The air was pushed out of the bag to accurately measure the carbon dioxide produced. The start times were recorded. The bag was sealed, set in a 24° C environment, and then timed until the bag popped open. The procedures were repeated with four samples from each code date. For the second experiment, a graduated cylinder was filled with water in a large bowl and flexible tubing was placed inside. One gram of yeast was mixed with 2.5 grams of sugar in a vortex tube. 15 mL of 40° C water was added. The water level displaced by gas was recorded after two, three, and four hours after the start time. Results The control samples, code dated 10/17/05, had an average time of 2 hours and 27 minutes until the bags burst. The yeast samples with a code date of 10/16/ 2002 burst after an average time of 3 hours 43 minutes. The yeast samples that displayed a code date of 6/13/99 had an average popping time of 3 hours and 54 minutes. The 1/11/97 yeast samples had an average bursting time of 4 hours, 46 minutes. The oldest samples, with a code date of 8/24/96, popped the bag in an average of 9 hours 24 minutes. For the second experiment, surprisingly, within the four hour trials the yeast produced gas, the two code dates tested, 10/16/02 and 10/17/04, did not show much difference in gas production. Conclusions/Discussion There was a definite correlation between the code date and the amount of time it took the bags to pop. Yeast past its code date still contained viable yeast cells, but the living yeast cells were fewer in number. The gas production rate for the control samples showed the most consistency between samples. Yeast companies probably mark a code date, because even though all of the yeast cells die at different times, before this date enough yeast will be alive to guarantee the yeast dough will rise in a predictable, reasonably short amount of time. For the second experiment, repetitions of the two samples tested (10/16/02 and 10/17/04) did not show much of a difference in their water displacement.	
Summary Statement This experiment was designed to test if yeast packets code dated 1996, 1997, 1999 and 2002 still contain viable yeast cells.	
Help Received My mother supervised my experiment with at home. My science teacher lent me her scale, old yeast samples, and other tools needed for the projects.	