CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
J1721

Project Title
Chasing Yeast in Yogurt

Abstract

Objectives/Goals
The objective of my experiment was to determine susceptibility of store brand and homemade yogurt to development of yeast contaminants. I hypothesized that commercial brand yogurts can develop yeasts > 10 CFU/mL at both, refrigerated and room temperatures. I also hypothesized that homemade yogurt would be least susceptible because it is prepared fresh daily.

Methods/Materials
A 1:4 dilution of 15 varieties of store brands and homemade plain/ strawberry, organic/ non organic yogurt each was prepared with sterile water. 1mL of each sample was inoculated onto two sets of 3M petri film Yeast and Mold count plates and incubated at room temp (72 degrees F) and refrigerated temp (42 degrees F). The pH level was measured and numbers of yeast colonies developed were counted daily. The experiment was repeated 2 more times but to keep the variables controlled, only 8 plain yogurts were tested. I then combined the best and worst performing yogurts in different proportions and used them as starter culture for improving the most susceptible yogurt. Finally, an anonymous survey was carried out to understand consumer habits associated with yogurt preparation and consumption.

Results
100% of yogurt samples developed yeast colonies > 10 CFU/mL by day 5 at room temperature. 7 out of 8 samples demonstrated yeast growth > 10 cells/mL at refrigerated temperature, confirming contamination. Exception was refrigerated sample of Voskos Greek yogurt. Maximum and fastest growth was observed in organic homemade yogurt. At both temperatures, the pH level decreased as yeast growth increased. Samples at room temperature were more acidic and developed more yeast. A 76% improvement in homemade yogurt was observed when prepared from 100% Voskos culture!

Conclusions/Discussion
Hypothesis 1 verified TRUE since 87% of yogurt samples proved susceptible to spoilage. Voskos Greek yogurt is strained of whey containing sugar and moisture, essential ingredients for yeast development. Yogurt made at home used starter culture from previous batches of yogurt possibly contaminated over time and involved no processing. Thus hypothesis 2 proved FALSE. Thanks to this experiment, my family is now eating the drastically improved yogurt I cultivated! This study raises significance and awareness of proper yogurt preparation, handling and consumption habits among consumers, particularly Indian families where yogurt is prepared at home on a frequent basis.

Summary Statement
Homemade as well as store brand probiotic yogurts are susceptible to spoilage due to development of yeast contaminants > 10 CFU/mL at both room temperature and refrigerated temperature.

Help Received
Parents helped with supplies and yogurt preparation/purchase; Prof. Hemmingsen provided preliminary direction prior to experimentation. Mr. Eric at Sun Valley Diary provided a tour of his yogurt manufacturing facility. Sarah and Ronit provided mentorship.