CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
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Project Number
J1135

Project Title
The Effectiveness of Preservatives in Homemade Dog Treats

Abstract

Objectives/Goals
The main objective was to find out how long it takes my dog treats to spoil and then figure out which preservative (Tocopherol, Benzoate, and Propionate) works the best. I hypothesized that Tocopherol would be the most effective because it is commonly found in Kirkland Dog Treats and other grainy foods such as Cheerios and granola bars, which have ingredients similar to my dog treats.

Methods/Materials
1. Four groups of cookies (8 in each group) were made each containing either Tocopherol, Benzoate, Propionate, or no preservative (control)
2. Incubate all 4 groups of cookies at high humidity (85%) and temperature (95 degrees).
3. Observe the cookies for mold growth for 9 days
4. Remove and freeze one cookie from each group at day 0, 3, 6, and 9
5. Determine bacterial content in each of these samples by plating onto petri dish followed by incubation and visual counting of bacterial colonies.

Materials included: whole wheat flour, chicken stock, oatmeal, egg vegetable oil, petri dishes, sterile water, test tubes, preservatives (Benzoate, Tocopherol, Propionate). Equipment included incubator and digital scale.

Results
The first part of the experiment in which the cookies were placed in the incubator to speed up spoiling, the control cookie (without any preservative) developed mold by the third day. By Day 9 mold was covering 80% of the control cookie but was not seen on any of the cookies with preservative. The second experiment was to measure bacterial content. By day 3, all of the samples except the one with Tocopherol grew colonies of bacteria (the control sample had very many colonies). On day 6 and 9 all of the preservative samples had similar, but small numbers of colonies. The control sample showed more and more colonies on days 6 and 9.

Conclusions/Discussion
This project showed that preservatives can prevent spoilage of homemade dog treats. By two measures (visual mold growth and bacterial content) all three of the preservatives worked well preserving the dog treats for a longer time period compared with the dog treat without any preservative. However, it is possible that Tocopherol preserved them slightly longer. One possible reason for this is that Benzoate and Propionate are recommended to be used with low pH values. My cookies were at a pH level of 6.

Summary Statement
This project examines how well different preservatives can prevent homemade dog treats from spoiling.

Help Received
Father helped with laboratory experiments