CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

Alexander J. Howard

Project Number

33118

Project Title

Study on the Effect of Vitamins and Minerals on Fermentation of Grape Juice

Abstract

Objectives/Goals

The objective of this experiment was to determine if using additives, such as minerals or vitamins, will improve the fermentation of grape juice by creating a more healthy, sustainable yeast population.

Methods/Materials

The experiment had three groups: pure grape juice, grape juice with added minerals, and grape juice with added multivitamin and mineral pill. The CO(2) produced during fermentation was collected using a bubbler system. In Phase 1 of the experiment, measurements of the volume of CO(2) collected were taken at various times, until CO(2) production stopped. After 12 additional hours, Phase 2 of the experiment began. In Phase 2, extra grape juice was added to determine which yeast population could most efficiently start producing CO(2) again through fermentation. Measurements of the volume of CO(2) collected were taken at various times, until CO(2) production stopped.

Results

In Phase 1 of the experiment, the data showed that the group with added minerals had a slightly higher CO(2) production rate than the other two groups. In Phase 2, after adding additional grape juice, the group with added minerals produced a significantly higher amount of CO(2) in a shorter amount of time. In the first hour, it produced over 100% more CO(2) than the group with pure grape juice.

Conclusions/Discussion

The data collected shows that you can use additives to improve the fermentation of grape juice by yeast. The addition of minerals (calcium, magnesium, and potassium) provided the most benefit in the experiment, even better than the multivitamin and mineral pill.

Summary Statement

The project focused on determining which nutrients could help make a healthier, more sustainable yeast population.

Help Received

Mother provided materials; Father helped build the gas collection system