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Exploration of How Different Alcohol Yeasts Ferment at Room Temperature

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Biology 160

Abstract

This research project was started to explore which alcohol yeast ferments the fastest at room temperature. We hypothesize that the Belgian Wheat Yeast would ferment the fastest at room temperature. Our hypothesis was not supported during the experiment. This exploration is relevant to people looking for an easy and quick way to brew alcohol yeast.

Introduction

Using three different types of alcohol yeast; cider (MO2), gluten free ale, wheat yeast (T58); we controlled this experiment by replicating trials in cool and warm temperatures to base our room temperature data on. The use of different temperature can help companies decide on what type of yeast is better in certain conditions

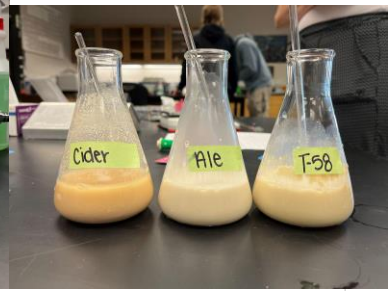
Methods

Materials & Location

For a successful execution of this lab equipment commonly found in biology labs is needed such as, graduated cylinder, fermentation tubes, packets of different alcoholic yeast (cider, ale, and t-58 wheat yeast), test tubes, water, 20% sucrose solution, a scale, 250ml breakers, something to mix the yeast, water, 10 ml graduated pipette, a pipette pump, a tray to put the yeast on a scale, holders for the test tubes, a timer or stopwatch. You will also need a fridge and an incubator close by or within use for the fixed trials of fermentation tubes of the different yeast

Procedure

First label 3 sets of three fermentation tubes as A1, A2, A3 to represent the Ale yeast, another 3 sets of three fermentation tubes as C1, C2,C3 to represent the cider yeast, and label the final 3 sets of three fermentation tubes as T1, T2, T3 to represent the T-58 wheat yeast totalling in 27 fermentation tubes. To continue the labeling label one beaker Cider, the second Ale, and the last beaker T-58, as well as labeling a test tube holder Ale, another holder Cider and the last holder T-5 , each test tube holder will hold 9 test tubes each . After labeling measure 10 grams of each yeast on three different trays, measure 100 ml of water in the graduated cylinder and add 100 m to each labeled beaker. Once each beaker has 100 ml of water add the respected 10 grams of yeast to the beakers and mix really well. Once the yeast is mixed take 10 ml of the 20% sucrose into each test tube which should be 27 total. After each test tube has 10 ml of the sucrose, using the graduated pipette and pipette pump, for the tubes in the Ale holder each tube will need 10 ml of the Ale yeast mixture, the tubes in the Cider holder each tube will need 10 ml of the Cider yeast mixture, and the last holder labeled T-58 will receive 10 ml of the T-58 wheat yeast mixture to each tube. After all the yeast is in the tubes with the sucrose solution, each test tube solution will be moved a fermentation tube labeled with the same yeast inside the test tube. After all 27 labeled fermentation tubes have the right yeast solution take one group of the Ale (A1,A2,A3) to an incubator, one group of cider, as well as one group of the T-58 wheat yeast. Do the same but instead of the incubator into a fridge, the last groups will be set aside and designated as the room temperature group. Look at each group every 5-15 minutes to see fermentation. Repeat these step twice completing two trails.



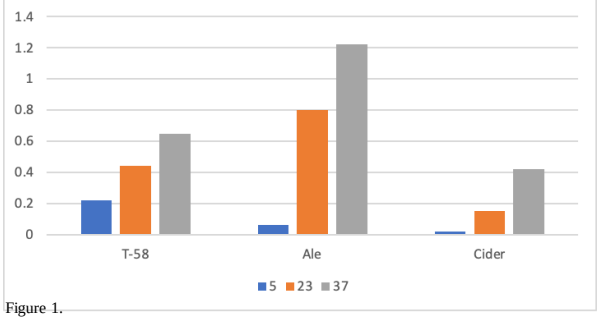


Figure 1.

This graph shows how different types of beer ciders fermented at different rates while also at different temperatures.

Discussion

Using the different yeast at different temperatures we saw that the Ale yeast fermented better at room temperature as well as in the incubator, the T-58 however, did the best in the fridge . After two trials of all three different yeast at each temperature we averaged the results for each concentrations fermentation rate. One can see how each type of yeast reacts the fastest at each temperature. The T-58 at room temperatures average fermentation rate was 0.44, inside the incubator was 0.65, and inside the fridge was 0.22. While the averages for the Ale was 0.8 at room temperature, 1.22 inside the incubator, and 0.06 inside the fridge. And lastly the cider had a fermentation rate of 0.15 at room temperature, 0.42 inside the incubator, and 0.02 inside the fridge. These results proved the hypothesis incorrect, the Ale yeast was the fermented the most at room temperature instead of the T-58. According to the website North corner brewery said theall Danstar Ale yeast was actually gluten free.

During testing the fermentation rate of three different types of alcoholic yeast we wanted to see how temperature would affect fermentation which is why we used the incubator and the fridge as control groups. Though we expected the yeast to not ferment at all in the fridge we were surprised to see the yeast adapt to the change of temperature and surely but slow saw it ferment just a bit as one can see on figure 1. The results from our research can be applied to the use of different techniques that could be used to save energy a well as less expenses that breweries could use. According to Monika on the *Sanctuary brewing company* "**cold fermentation** helps to reduce off-flavors like sulfur and diacetyl, as well as extend the shelf life of the beer. Temperature control has become a lot easier and less expensive for wineries of any size thanks to advances in technology and improved production methods."(2023, paragraph 21). Knowing that yeast can adapt to the colder temperature including being at room temperature can bring a new use to breweries that can bring flavors and save energy as well as money for companies.

Acknowledgements

We liked to give a special thanks to our instructor Lauren Maniatis for giving us the equipment needed as well as special thanks to our lab tech Bethany for getting us the yeast and solution for this experiment.

References/ Work Cited

Monika. (2023, January 3). Retrieved August 7, 2023, from https://www.sanctuarybrewco.com/temperature-control-the-consequences-of-fermenting-beer-thats-too-warm.

Yeast. North Corner Brewing | Yeast. (n.d.). http://www.northcornerbrewing.com/page/Yeast.aspx