Effect of pH on Yeast Activation in Leavened Bread

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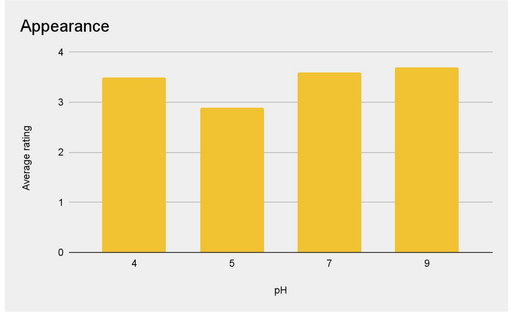
Introduction

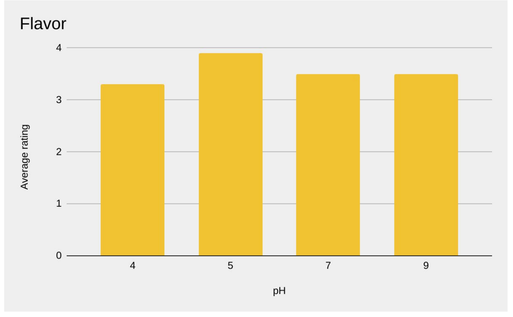
The purpose of this experiment was to determine the effect of pH on the gas production of yeast, measured by the volume and cell size of bread when yeast is activated in a pH of 4.0, 5.0, 7.0 and 9.0.

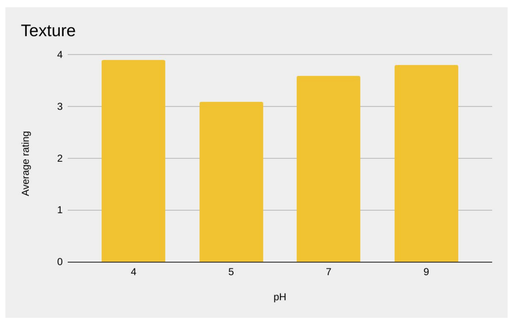
It was expected that the cell size for each pH would show a significant difference, with the acidic condition having the largest cell size and total volume, and the basic condition having very small air cells and being very dense. It was also expected that there would be a difference in flavor with each loaf, with the acidic loaves having a more sour taste.

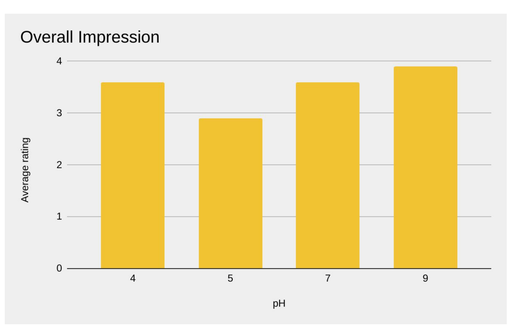
These factors are important because finding the conditions that are optimal for pH growth can help with the production of consistently-sized bread loaves.

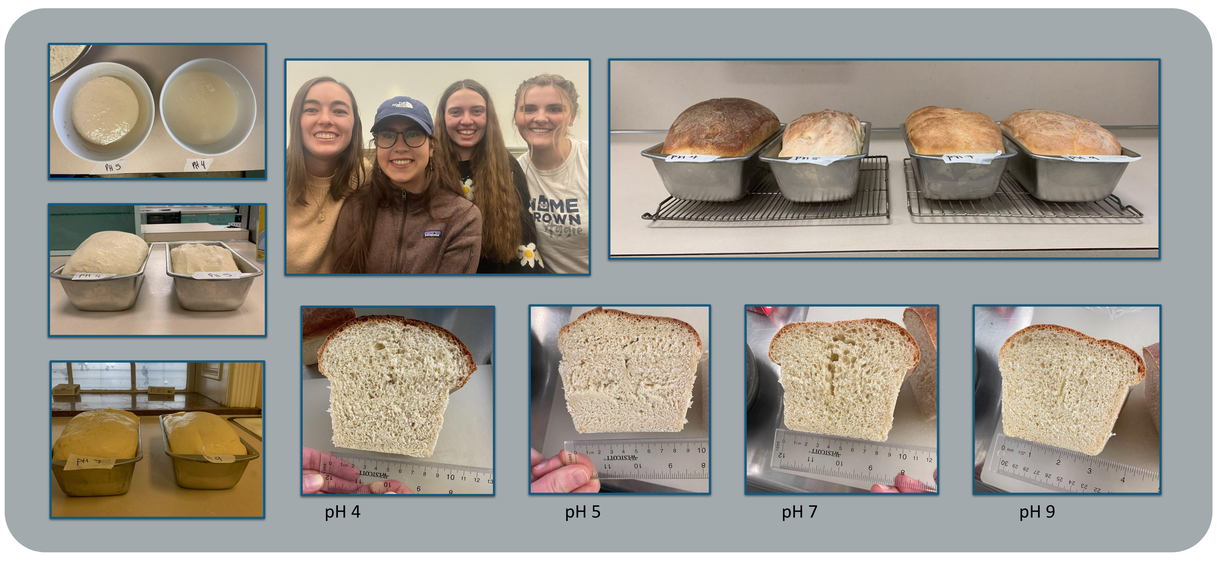
Sensory Panel Results











Methods

We chose a simple bread recipe and had each member make a loaf. Each group member had a specific pH assigned to them. The pH's we used were 4, 5, 7, and 9. The group members assigned to the acidic pH's used lemon juice and the basic pH member used baking soda. All members used pH testing strips to ensure that we had the correct pH environment for our yeast. Each member used the same ingredients and methods to eliminate extraneous variables.

We collected our subjective data through sensory ballets with random participants and analyzed our results through a graph shown above. We collected our objective data through seed displacement and cell size.

Results

As shown in the graphs, the differences in sensory characteristics were fairly minimal and averaged out between the four areas tested. Interestingly, the alkaline bread did the worst in every area except for flavor, where it did the best. In the objective tests, the largest differences were also seen in the alkaline bread, which was considerably lower in cell counts and volume. The high acidity bread was also significantly lower in cell counts.

Conclusion

We found that the different pH balances did not make much of a difference when it came to the flavor of the bread. We did find that the bread that had the pH level of 9 was more dense than the rest of the loaves. We also found that the acidic breads didn't rise as well as the neutral and basic loaves. Overall we had a lot of fun experimenting with different acidity levels to see if we would prefer baking our bread in that environment for future loaves.