



# Degree of stirring effects volume and tunneling in muffins



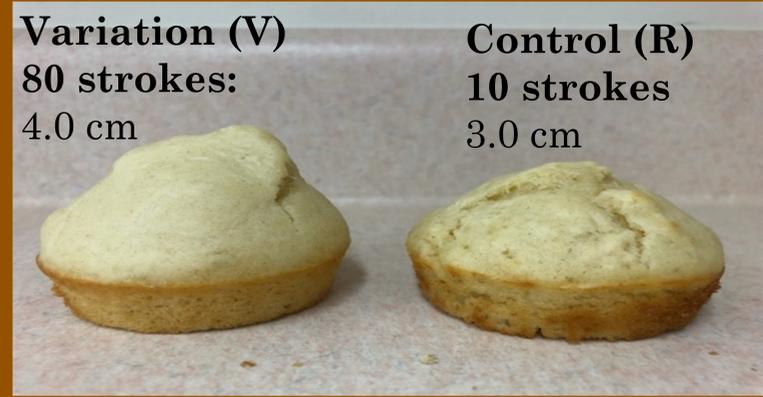
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## Abstract:

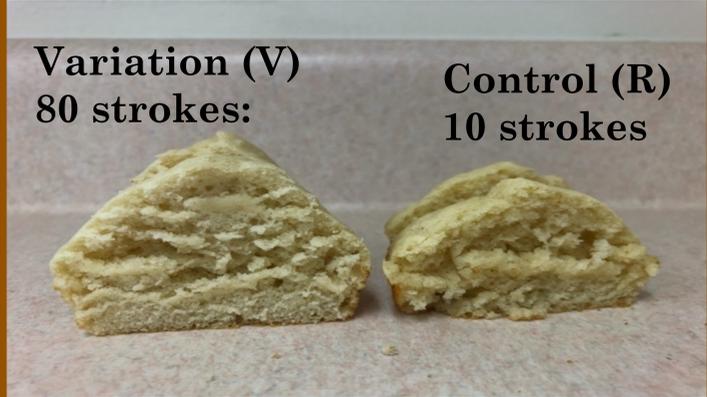
To investigate if degree of stirring would effect texture in muffins, two various batches were made. Two variants were used in the experiment, one control (R) with ten mixing strokes and one variation (V) with eighty mixing strokes. The researcher hypothesized that the degree of stirring in form of additional mixing strokes would increase volume and tunneling in muffins. The null hypothesis was that there would be no significant difference in volume and tunneling if additional mixing strokes were added while mixing the muffin batter.

The muffins with the eighty mixing strokes were affected by the gluten development which caused increased volume and tunneling. Further, these muffins had a much tougher texture in comparison with the control muffins softer and moist consistency. This study can be used to show how various mixing strokes cause gluten development which effects texture and appearance characteristics in muffins.

## Results



The independent variable of muffin strokes affected the dependent variable of muffin volume and texture. The variation with 80 strokes had a height of 4.0 cm and a peaked muffin top. The control (R) muffin variation had a standing height to index of 3.0 cm with a rounded muffin top.



	Height	Apperance	Texture
<b>Variation (R)</b>	3.0 cm	More appealing due to darker color	Moist and soft
<b>Variation (V)</b>	4.0 cm	Less appealing due to pale color	Dry, tough

The overall liking was better with the control (R) due to a softer and moist consistency. The control muffin's appearance was also more appealing and acceptable looking in contrast with the variation's peaked muffin top and tough texture. Tunneling could also be seen in the variation (V).

## Discussion

Extraneous variables of this study were size of the mixing strokes and how big each scope of the muffin batter was. This would influence the results by having various outcomes in size. Placement in the oven could also been a potential factor that would impact the result. By overmixing muffin batter this results in overdeveloping the gluten which then affects the characteristics of texture and volume. This study can be used to educate how to avoid excessive gluten development while baking muffins. Further, this study can be useful for baking producers by understanding consumers preferences of plain muffins.

## Conclusions

Changing the independent variable of muffin strokes will affect the dependent variable of muffin volume and texture. The hypothesis was accepted and the null hypothesis was rejected. Additional muffin strokes will affect volume and tunneling in plain muffins. The variation had a peaked muffin top due to the overdevelopment of gluten. The overmixing also caused the variation with 80 strokes a tougher and more dry texture in comparison with the control (R). Further, greater tunneling occurred in the variation muffin.

## Methodology

The muffin method was utilized for this experiment. 6 muffins were baked for 10 minutes at 425 °F in oven. Once baked, the same exact procedure was utilized for both variations. The control (R) muffin was mixed with 10 strokes while the variation was mixed with 80 strokes. Post baking muffins were objectively evaluated by measuring height to index ratio by use of a ruler. Hedonic rating was utilized for conducting the sensory evaluation.

## References

McWilliams, M., (2017). Foods Experimental Perspectives. *Pearson*