Effects on volume and tunneling of muffins based on stroke count

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Introduction

When making muffins, over mixing can over develop the gluten making it stronger. When the gluten becomes too strong, carbon dioxide becomes trapped and forms tunnels when trying to escape. With the perfect muffin batter, the batter is weaker, and the carbon dioxide can escape more evenly, making a more tender muffin. Independent variable for this experiment was to show the effects of the number of strokes on the volume and tunneling of plain muffins. Different stroke variations were compared to a control and evaluated for objective test on volume and tunneling, then sensory test comparing texture and flavor.

Results

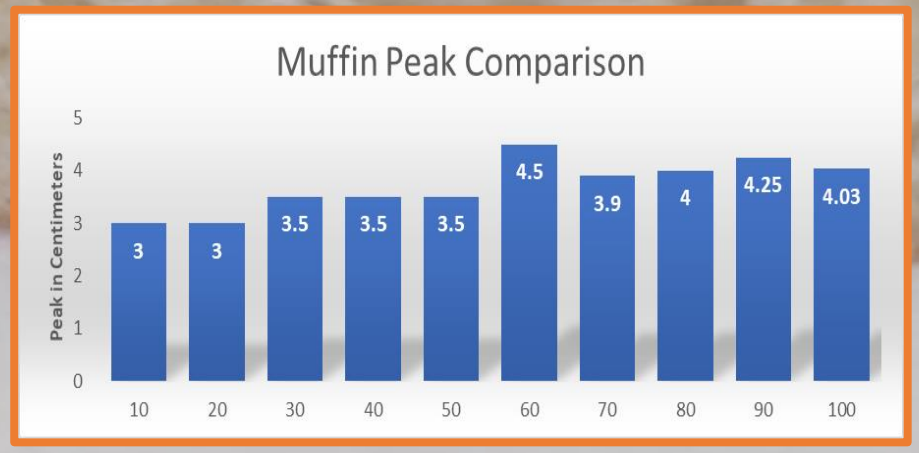
The control was 3 cm at its tallest peak. The variation with the most strokes (100) measured at 4.03 cm, but the muffin with the highest peak was variation 6 (60 strokes) measuring at 4.5 cm. Comparing the muffins next to each other, variation 4 had more tunneling and holes, and had a noticeable peak. The control muffin browned more evenly around the edges. The Variation was not uniformly browned all around. The texture of both was comparable. They both had the same crumble, and the same feel. When taste comparing the 2, the initial taste and mouth feel was the same. Tasting the muffin that was mixed 90 strokes, it was noticeably more tough and dry.

Discussion

As the muffins progressed in the number of strokes, the peaks should get taller, and there should be more tunneling. But the height numbers were not consistent with these results. This could be from measurement error, the varying ways people stir, what they consider to be a full stroke, or even how long their batter sat out mixed before baking.

Method

In comparing variation 4 to the control, extraneous variables were avoided by using the same oven, utensils and measuring equipment throughout both experiments. Dry ingredients were measured and sifted together. Egg, milk, and oil was mixed and poured in the middle of the dry ingredients. The batter was then mixed for 10 full strokes, starting with 4 into the center, and finishing with 6 large strokes scraping from the 10 minutes, then cooled 5 minutes. The same steps were performed to make the batter for variation 4, except when mixing the batter. This time there was a total of 40 strokes, starting with 10 strokes mixing the batter from the center to the outside, and then finishing with 30 large strokes scraping from the outside of the bowl to the center.



Conclusion

When making the perfect muffin, there are many factors that can change the end results. After reading this experiment, you can see that how you prepare the muffin has a huge effect on the overall appearance and taste of the muffin. The muffins that were over stirred had much more tunneling, higher peaks, and tougher mouth feel. Muffins that were mixed minimally were tender throughout, with little peaking and more even browning.

References

McWilliams, M.(2017). *Foods: Experimental perspectives* (8th ed.).Upper Saddle River, NJ: Pearson.