

All Purpose Flour Alternatives in Brownies

Introduction

Flour is used as a binding agent in brownies. Gluten free products are often readily available, but some gluten free flours do not have the same affects that regular all purpose flour does. Banana flour, oat flour, and rice flour were tested in this experiment.

Methods

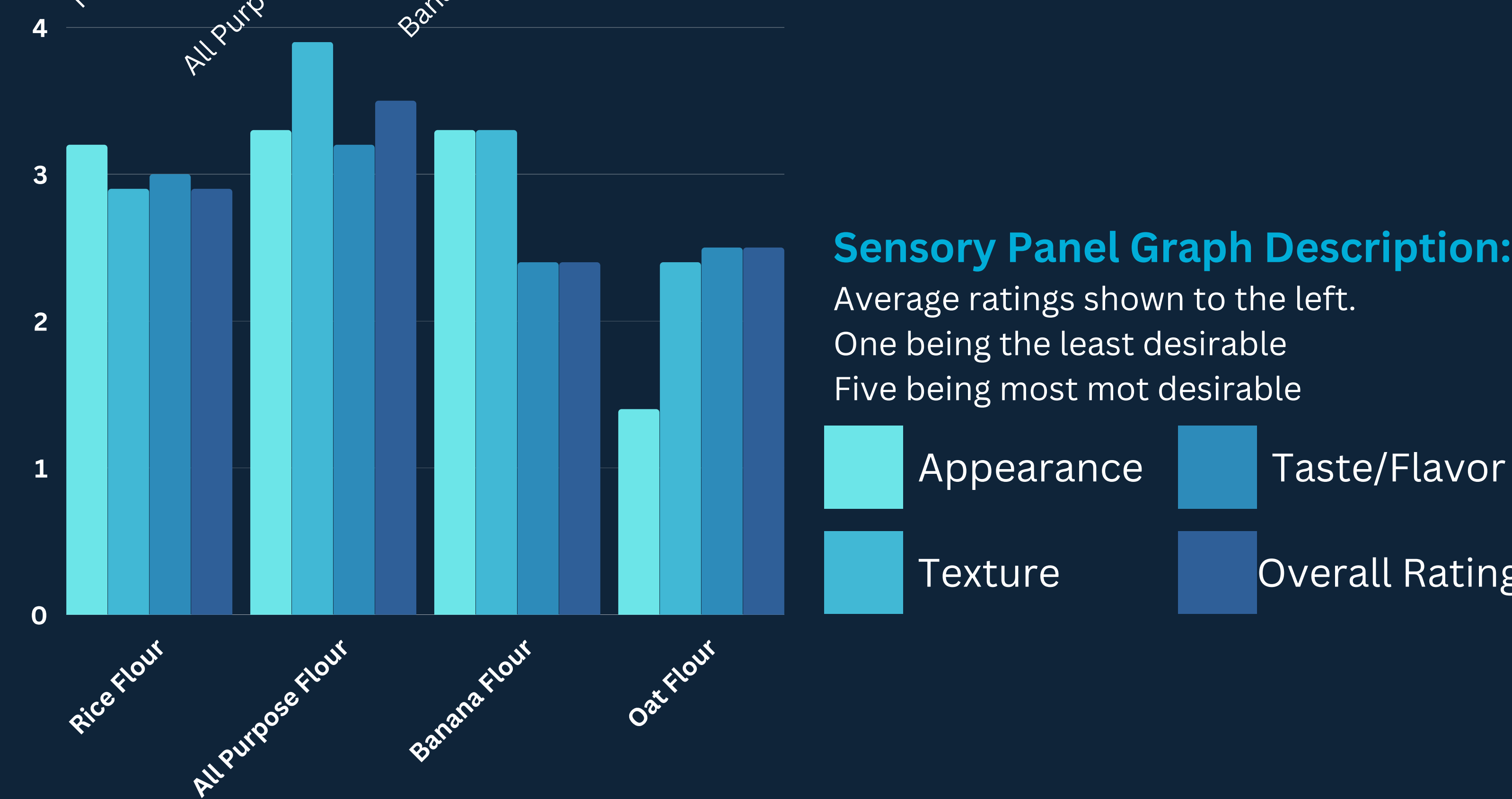
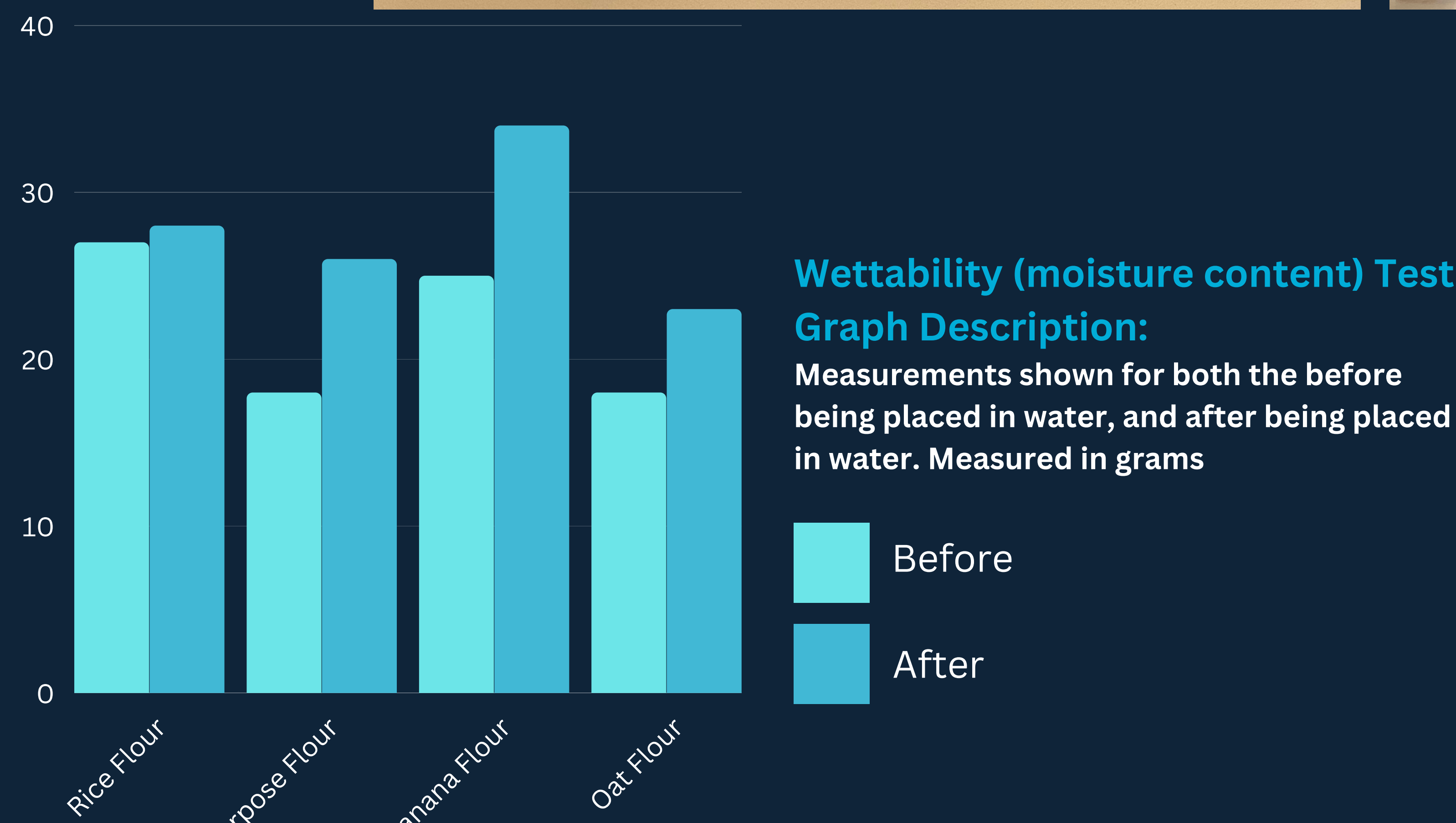
- All ingredients were measured before mixing together.
- Brownie mixtures were mixed the same amount of times.
- All batches were baked on the same rack in the oven for the same amount of time.
- Seed displacement and wettability tests were used.

Conclusion

All of the batches of brownies turned out to be edible. All Purpose flour and rice flour were the most popular among participants. Banana flour was the least popular. All brownies were similar volumes, but each one resulted in different weights after being placed in water. All purpose flour is the first choice, but if looking for a gluten free alternative, oat flour and rice flour brownies were a close second.

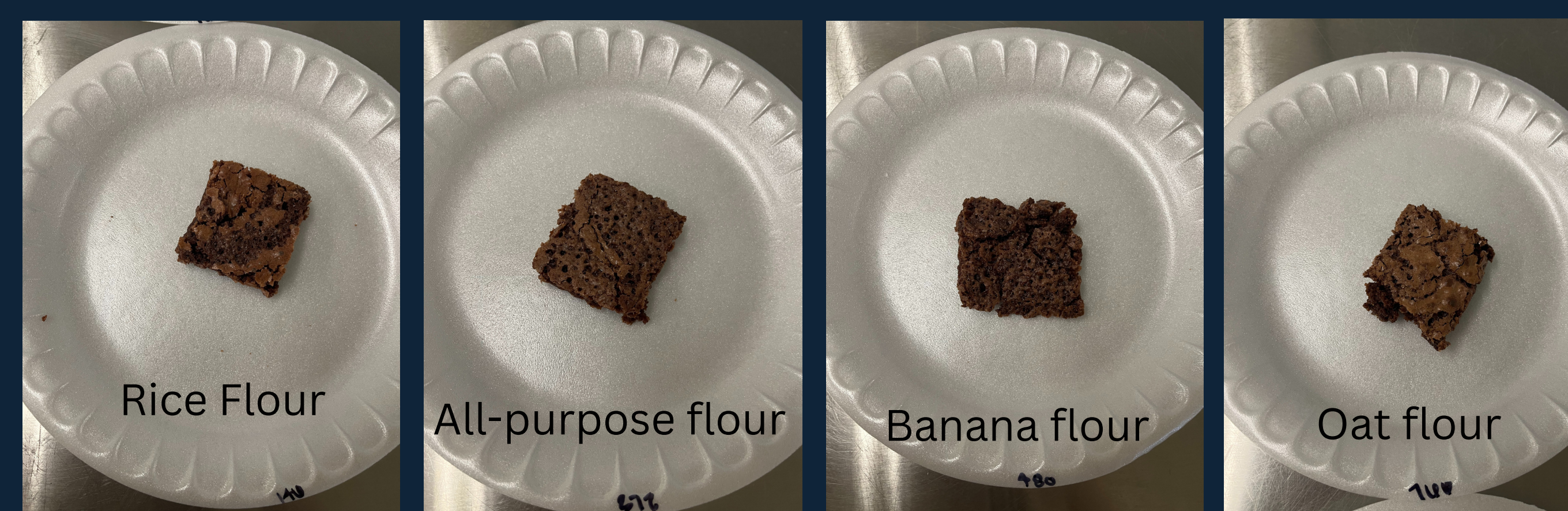
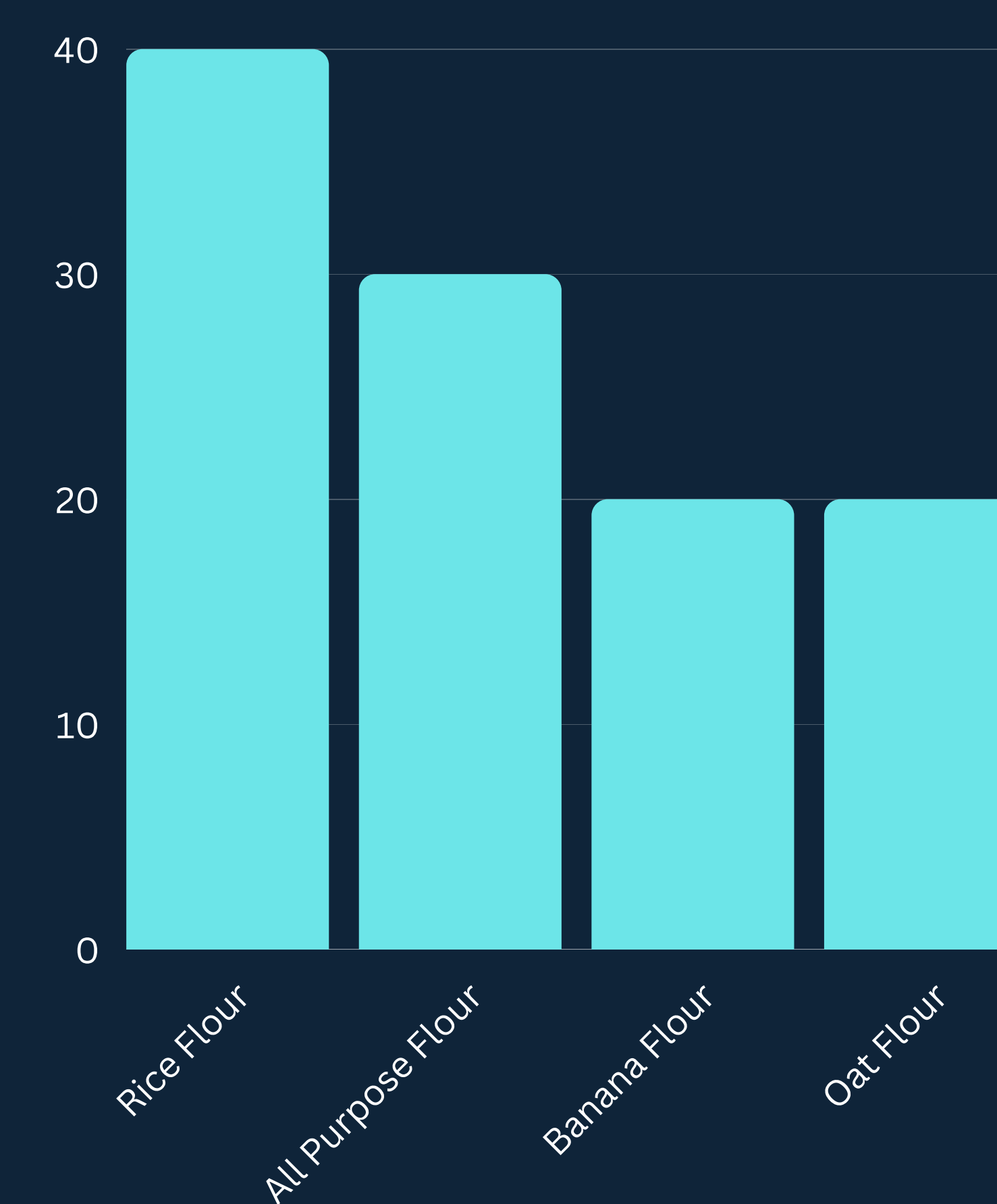
References

Angie. (2022, November). Best brownies. Allrecipes. Retrieved March 22, 2023, from <https://www.allrecipes.com/recipe/10549/best-brownies/>



Seed Displacement (volume) Test Graph Description:

Measurements shown for volume in ccs.



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Results

All Purpose Flour

All purpose flour is widely used in brownies. The result is a fluffy, gooey, flavorful product. This product almost always resulted that way. Compared to other brownies it was more sticky and crumbly. It had the best taste.

Banana Flour

Banana flour brownies were very surprising. This batch turned out to be the fluffiest of all of the batches that were made. These brownies had the least desirable flavor overall.

Oat Flour

Oat flour is made from oats that are blended to a fine powder. The taste was good but ended up being not ideal for brownies because of how it looked.

Rice Flour

Rice flour also had good results. They ended up being second favorite overall next to the all purpose flour brownies. They were surprisingly really fluffy and had great taste.

Objective Test Results:

Seed displacement test (volume measurement):

All purpose (372)- 30cc, 0.8 cm tall
 Banana flour (766)- 20cc, 1.5 cm tall
 Oat flour (146)- 20 cc, 1 cm tall
 Rice flour (480)- 40 cc, 1.5 cm tall

Wettability test (moisture content):

All purpose- before 18 grams, after 26 grams
 Banana flour- before 25 grams, after 34 grams
 Oat flour- before 18 grams, after 23 grams
 Rice flour- before 27 grams, after 28 grams