A Taste of Gluten-Free Italy:

Substituting the Structural Agent in Fettuccine

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Background

We tested the outcome of substituting various flour structural agents for the all-purpose flour used in fettuccine noodles. The goal was to see the result produced and find an option for a gluten -free fettuccine pasta noodle. A food allergy to gluten is one of the top 8 most common food allergies, so finding an alternative benefits a large population of people. Our overall results showed a large difference between each flour substitute after cooking and from our objective and sensory tests. We used water absorption and density as well as testing on appearance, flavor, color and overall acceptability.

Our Why

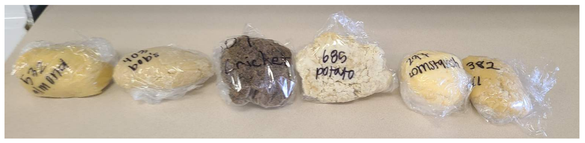
The purpose of this experiment is to determine the effect on appearance, flavor, and texture when almond flour, Bob's one –to-one gluten free flour mix, cricket flour, potato flour, and cornstarch are substituted for all-purpose flour in fettuccini noodles.

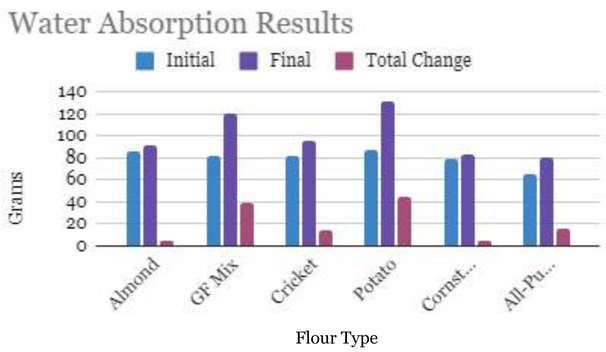
Process

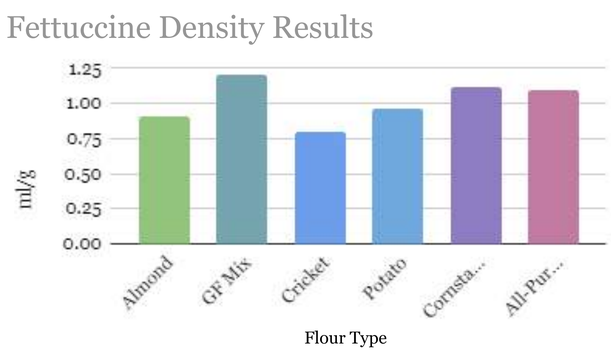
Density was measured by weighing 59 ml of dough prior to forming it into noodles. The value obtained was divided by 59 ml to yield the density. Water absorption was measured by weighing the total dough used before and after being cooked. The difference between these values represented the amount of water absorbed by each flour. All doughs were created using the pasta well method, using the same recipe by weight, kneading techniques, cooking and wait times.
See tables below.

Findings

The results showed that Bob's gluten-free flour mix had the highest density followed by cornstarch, all-purpose, potato, almond, and cricket as the least. Potato had the highest water absorption at 51.72% with cornstarch at the least water absorption at 5.06%. Sensory evaluations revealed that medium color intensity and low flavor intensity was the most desirable. Findings were mixed on tenderness and mouth feel. Some sensory evaluators opted out of testing the cricket flour pasta noodles.
See tables below.







Conclusion

The best substitute for all-purpose flour in fettuccine pasta is Bob's gluten-free flour mix. The ratios of wet to dry ingredients in all other tested variables did not produce a desired result. The dough ranged from too dry to too wet which caused the dough to need to be hand cut instead of placed in a pasta maker. While the Bob's gluten-free flour mix was the most desirable in this study, more testing would be needed.

Resources

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