

Formation of Gluten Balls

This activity is great to do in a group, so each person is in charge of one of the flours.

1. Measure 100 grams of the following flours:
 - a. All-purpose flour
 - b. Bread flour
 - c. Cake flour
 - d. Whole wheat flour (optional)
 - e. Rye flour (optional)
2. Add $\frac{1}{4}$ cup cool water to each bowl of flour. Mix to form a stiff dough. Scrape all of the dough from the bowl and form a ball.
3. Let dough rest for 5 minutes to allow the flour to hydrate.
4. Knead each ball of dough for about 15 minutes to develop gluten. The dough should be smooth and elastic.
5. Place each dough ball in its own bowl and cover with cold water. Let soak for 5 minutes.
6. Preheat oven to 400 degrees Fahrenheit.
7. Gently knead each dough under water to wash out the starch. Change water in the bowls as needed being careful to retain all bits of gluten. Alternatively, the dough can be rinsed in a sieve under gently running water. Press each gluten ball in the palm of your hand and squeeze to get rid of the starch until water is clear and an elastic, grayish mass remains.
8. Drain excess water from the gluten balls and shape into a bubble by folding in a little air as you round the gluten into a ball. Estimate the diameter of the gluten balls (1/2 inch, 1 inch, etc.). Weigh the gluten balls.
9. Place each gluten ball on an ungreased cookie sheet and bake at 400 degrees Fahrenheit for 15 minutes, then reduce the heat to 300 degrees Fahrenheit for 40 minutes longer until the gluten balls are dry and crisp. Estimate the size of the baked gluten balls.

Compare the texture and structure of the gluten balls and consider:

- Texture Before Baking – is the gluten ball sticky, gummy, pliable, elastic, rubbery?
- Structure After Baking – is the baked gluten ball compact, open, porous?
- Volume – estimate the volume of each gluten ball (you can use measuring spoons and cups as references)

Want to learn more about what is happening? Check out this fun video about gluten: Science - What is Gluten? Here's How to See and Feel Gluten

https://www.youtube.com/watch?v=zDEcvSc2UKA&feature=emb_logo

Ready to do some baking? Check out this Flour 101 article for more information about the flours you can use: <https://www.foodnetwork.com/recipes/packages/baking-guide/flour-101-guide-to-different-types-and-uses>