

### SWEET POTATO BISCUITS

Serving Size: 12 servings, 1 per student

#### Ingredients:

- 2 cups flour (NUT FREE)
- 1 tbsp baking powder
- 1 tsp salt
- 1/3 cup butter, melted
- 1 cup canned sweet potatoes
- 1/2 cup water

#### PREP BEFORE CLASS:

Preheat oven to 450. Place butter on oven to soften. Line baking pan with foil and grease. Open can of sweet potatoes, drain and rinse.

#### Directions:

1. Ask students to measure the dry ingredients (flour, baking powder, and salt) into a medium bowl and mix.
2. Ask students to measure canned sweet potatoes and water into the food processor. Blend until smooth.
3. Have another student add all wet ingredients to the dry ingredients and mix until just combined
4. **Testing gluten formation by over mixing:**
  - Place 3 biscuits onto a lined and greased tray and continue mixing batter 10 more times.
  - Place 3 more biscuits on the tray and repeat with 15 and 35 additional stirs.
5. Bake for 10 minutes or until golden brown.
6. Serve with mincemeat.
7. Do a taste test of each biscuits batch to see how texture and density changed due to over mixing and gluten formation,
8. Enjoy with mincemeat.



### MINCEMEAT

Makes 12 servings, 2 tbsp each

#### Ingredients:

- 1/2 cup raisins
- 1/2 cup dates, pitted
- 1 apple
- 1 orange
- 1/2 tsp cinnamon
- Pinch of salt

#### PREP BEFORE CLASS:

Wash dry and fresh fruit, core apple, and cut apple into wedges.

#### Directions:

1. Pass out apple wedges, have student helpers chop apple into small pieces.
2. Have students remove pits from dates
3. Give each student a turn zesting the orange into a small bowl. Once zest is removed, cut orange in half and help students squeeze out all the juice.
4. Ask students to measure all mincemeat ingredients including orange juice and zest into food processor. Blend until mixture is chopped and sticky, but it should not be completely smooth.
5. Spoon roughly 2tbsp of mincemeat onto each student's plate. Have students spoon it onto biscuits. Can also be eaten by itself with a spoon. Enjoy!



# LESSON 10:

## THE KNEED-TO KNOW DOUGH: GLUTEN

### OBJECTIVES

- Describe protein bonds, and explain the role that those bonds play in gluten formation
- Demonstrate that different factors and variables can affect gluten outcome
- Describe gluten related intolerances
- Understand what grains contain gluten

### VOCABULARY

- **Gluten:** A mixture of two proteins present in cereal grains— especially wheat — that is responsible for the elasticity, texture, and structure of dough.
- **Glutenin:** One of the two major proteins in wheat flour, making up 47% of the total protein content; contributes to the formation of gluten
- **Gliadin:** The second of the two major proteins contributing to the formation of gluten, can be found in wheat and several other cereal grains
- **Protein:** A substance found in foods consisting of long chains of amino acids joined by peptide bonds; an important part of the human diet

### INTRODUCTION

🕒 3-5 min

Questions to ask students before starting:

- Have you heard of gluten before?
- Have you heard of celiac disease?
- What baked goods can you find gluten? What role does it play?
- Does gluten have a taste? What is the texture?

Let students share their guesses and opinions. Tell them that at the end of the class they will have a good idea on how to answer these questions. There might be students in class with gluten intolerance – let them share their experience.

### DEVELOPMENT

🕒 5-7 min

- Gluten is a protein made of two proteins called glutenin and gliadin. These can be found in products made from wheat, barely, and rye (oats doesn't natural contain gluten but they are often cross contaminated with these gluten containing grains). When water is added to the flour, a stretchy protein is formed, gluten. Before baking, gluten has a sticky, stretchy texture. When it bakes, gluten has a bouncy, chewy texture. Since it is a structural protein, gluten is responsible for holding baked goods like muffins, breads, and even pancakes together. For example, when looking at a slice of bread, gluten is the netting between all the holes that holds the bread together.
- When you knead dough together, the gluten is being formed. The more you mix/knead, the more gluten forms. But what happens when you over mix? As you keep on working the dough, the gluten becomes overworked and will form a stringy, sticky dough. The dough will feel tight, tough, and wont stretch properly. As you are mixing, have the students observe the texture changes in the dough.
- When baked, the overworked biscuits will rise too much but still create a dense, doughy inside. The water in the biscuit Compare the insides of the properly made biscuit to the over mixed biscuit. See how the textures of the two are different. Do they taste different? Does it have the same bounce? Explain to the students that once you overwork dough, there is no going back, so it is important to not overwork flour products to prevent this kind of outcome.

# LESSON 10:

## THE KNEED-TO KNOW DOUGH: GLUTEN

### STAR INGREDIENT: SWEET POTATO

- What food group are sweet potatoes in? Vegetable group!
- Why are sweet potatoes good for us?
  - Vitamin A: for healthy eyes and skin
  - Vitamin C: for healthy immune system, helps fight infection
  - Calcium: for bone strength
- Are yams and sweet potatoes the same thing? Sweet potatoes and yams are not the same thing! Although the “yams” you see in the grocery store are probably sweet potatoes. True yams grow in the Caribbean. They have a rough, scaly skin and they're lower in nutrients than sweet potatoes.

### PRO TIP

Are you in a sticky situation?

- Don't be afraid to add flour to the dough while you are flattening it! This will keep the dough from sticking to you and keep it where it belongs.
- Here is another tip: Make sure to work on a lightly floured surface! Lightly sprinkle some flour to your surface to prevent it from sticking.

### COOKING

🕒 35-40 min

- As you preparing your first recipe, Sweet Potato Biscuits, students will be able to see how gluten forms and changes texture of biscuits, if you over mix the dough.

### CULINARY TECHNIQUE: KNEADING

- Kneading means to work the dough, usually by hand, for the purpose of developing the glutes in the flour, which is what gives baked goods their structure and texture.
- What Kneading Does?
  - The process of kneading the dough helps to evenly distribute the ingredients and incorporate air, which assists in making the bread light (versus dense) and contributes to the overall texture of the loaf, both inside and out. Most importantly, the act of kneading develops gluten, which is necessary for the bread to expand without bursting.
- What are the Ways to Knead Dough?
  - The usual technique for kneading involves placing the ball of dough on a flat, lightly floured surface and pressing it with the heel of the hand in a sort of forward rolling motion, then rotating the dough and repeating. The dough is both squeezed and stretched; it is this squeezing and stretching that develops the gluten molecules.
- Just the right amount of kneading
  - If you think you have kneaded enough but the dough is limp and loose and won't hold shape, these are signs you need to knead a bit more. The dough should also not be shaggy or tear easily; continue to knead until the dough is smooth and holds together.

### DEVELOPMENT CONT.

🕒 5 min

Discuss other topics related to gluten as you work on the recipes.

- Celiac Disease: A genetic digestive disease in which the person is unable to properly digest gluten, often resulting in a dangerous autoimmune reaction that damages the gut, this can be triggered by eating even the smallest traces of gluten.
- Wheat Allergy: Like other allergies, wheat allergies develop when a person's immune system becomes sensitized and overreacts to a stimulant. This is often triggered by wheat products.

# LESSON 10:

## THE KNEED-TO KNOW DOUGH: GLUTEN

### FUN FACTS

- Alternatives for gluten sensitivity: almond, oat, rice flours.
- Wheat allergies is one of the top eight food allergens in the US and common for children

### 5 SENSES

- Sight
- Smell
- Touch
- Taste
- Hearing

### 5 TASTES

- Salt
- Sweet
- Bitter
- Sour
- umami

### ASSESSMENT

- Use questioning and observation throughout
- Think-Pair-Share: Teacher listens to responses
- Observe children as they complete each task and skill
- Thumbs up and down to confirm understanding

### DEVELOPMENT

- Non-celiac Gluten Sensitivity: A gluten intolerance is a condition that causes a person to react after ingesting gluten but lacks the same antibodies and intestinal damage of celiac disease. This type of sensitivity is triggered by gluten, but reactions do not necessarily always occur.
- Only 1 percent of Americans are diagnosed with celiac disease, but an estimated 6-7% of the population suffers from gluten sensitivity

### TASTE TEST

🕒 2-3 min

- As you are ready to taste food - complete The 30 Second Silent Taste Test: Students will engage in mindful eating by silently tasting the first recipe for 30 seconds.
- Remind the class while they are tasting to focus on their 5 senses (see sidebar for details)
- How would you describe the dish? Use 5 tastes to describe it and or adjectives (see Words to Describe Food Taste, Smell, or Texture page at the beginning of the instructor guide)
- Repeat this for the second recipe.

### THUMBS UP TEST

🕒 2 min

- Carry out the Thumb Test: Thumbs up/thumbs to the side/thumbs down.
- If time permits students can share comments.
- Key Qs: How might you change the recipes, why do/don't you like it, were there any strong flavors or textures?

### CLEAN UP & DIMISSAL

🕒 5 min

- Clean up the classroom. Allocate roles such as putting scraps and left overs in the trash, creating a pile of all chopping boards and aprons, wiping down surfaces and checking the floor.
- Make sure you leave the classroom the same way you found it.
- Dismiss in an orderly line and collect signatures from parents.