

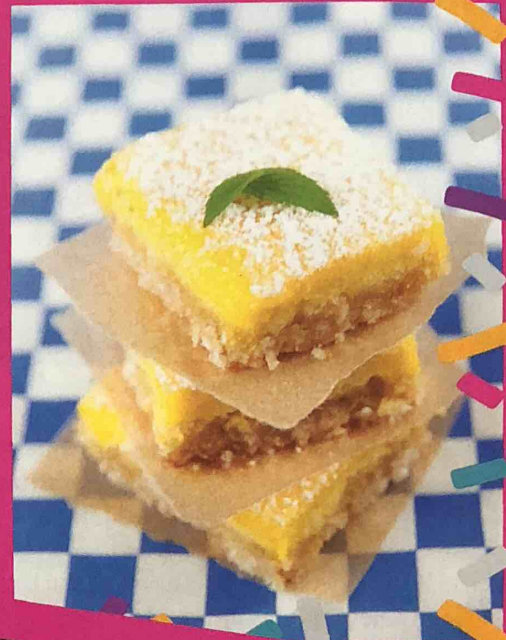
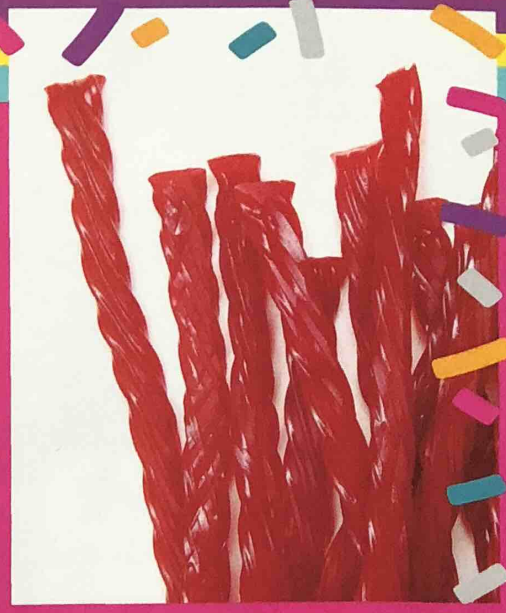
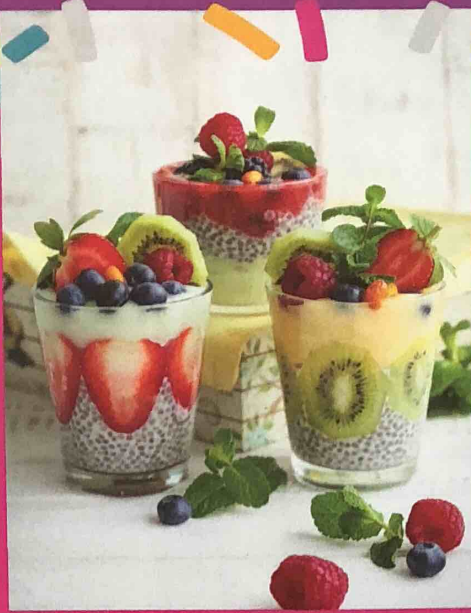
# Who Needs Wheat Flour, Anyway?

A SEARCH FOR GLUTEN-FREE GOODNESS



by Kathryn Hulick

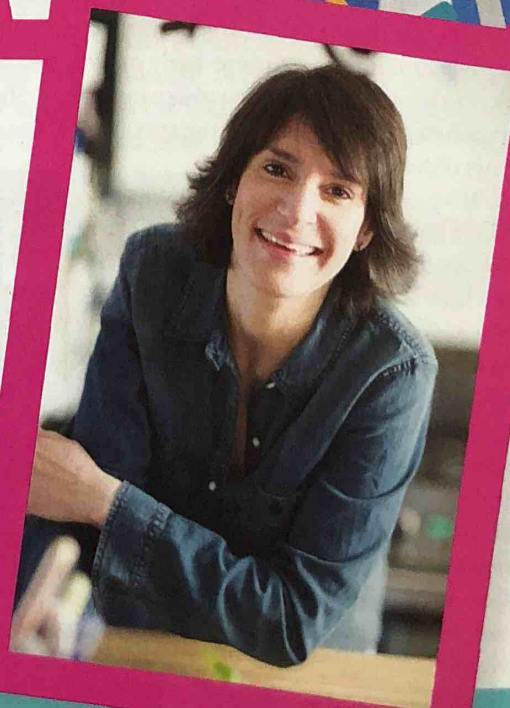




**T**he stench of dirty sweat socks filled the air. But no one had been to the gym. The awful smell emanated from Nicole Hunn's oven. She was baking a cake. And it contained flour made from garbanzo beans. "When you bake with bean flours, they stink!" she says. But she wasn't upset about the smell. "I was so stupid and happy," she says.

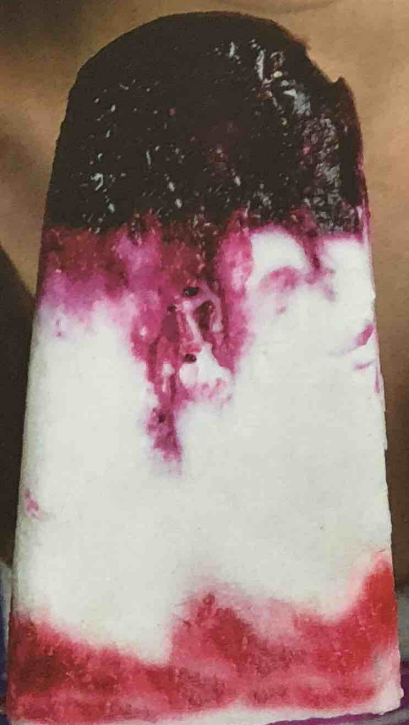
### Crummy Cupcakes

She was happy because she was making something that her son could eat. He has celiac disease. People with this disease get very sick if they eat anything containing gluten. Gluten is a mixture of two proteins found in many grains. These include wheat, barley, and rye. Wheat is in all-purpose baking flour. The ingredient finds its way into all



◀ Nicole Hunn is the author of the blog *Gluten Free on a Shoestring*.





sorts of foods. Cakes, cookies, brownies, muffins, bagels, breads, pasta, pancakes—they all normally contain gluten. Hunn cried when she found out her son would never be able to eat gluten. “It seemed so sad,” she remembers.

Hunn says she was “stupid” at the time of the garbanzo bean cake. She was at the very beginning of her journey as a gluten-free baker. She didn’t know any better. Stinky cakes weren’t the only problem she ran into early on. For her son’s first birthday, she was determined to make cupcakes. She ordered an expensive gluten-free baking mix from Canada. Her son and his older sister tried the cupcakes. They both threw up. “It was vile,” says Hunn. Besides the gross taste, the cupcakes didn’t hold together. They were grainy and spread crumbs everywhere.

More than a decade later, Hunn has perfected recipes for gluten-free cupcakes, cakes, cookies, and much more. She’s written five cookbooks and runs a popular blog on gluten-free baking. Her kids and their friends love her food. “I’m not some wizard or anything,” she says. “But homemade is usually better than store-bought.”



## Gluey Gluten

It seems like it should be simple to make something gluten free. Just take out the wheat flour and put in gluten-free flour instead. In Hunn’s experience, though, this doesn’t lead to the best results. “There is no such thing as a cup-for-cup replacement,” she says.

The problem comes down to chemistry. Gluten has a special property. Its proteins form long, stringy strands. As you knead bread dough, it gets soft and stretchy. “That’s the gluten protein,” explains Yael Vodovotz. She is a food scientist at The Ohio State University. Gluten allows dough to stretch. And as bread bakes, those stretchy strands blow up like balloons. They create pockets of air. This gives bread its soft, light texture. Many other food proteins, like those in milk and eggs, are shaped more like little balls. They can’t

do what gluten does. “They don’t have that stretchability. They can’t form nice balloons around air bubbles.” As a result, gluten-free bread is usually dense and crumbly. In cakes, cookies, and muffins, air bubbles aren’t as important. But in these foods, gluten acts as a kind of glue, holding the structure together. Gluten also helps absorb water.

Gluten proteins are just one component in wheat flour. The other is a carbohydrate called starch. Many popular gluten-free

## GOING THOROUGHLY GLUTEN FREE

For people with celiac disease or a wheat allergy, a tiny grain of flour may cause serious health problems. It’s great for these people to have gluten-free options. But not everyone who makes gluten-free foods is careful enough. “Flour is lighter than air,” explains Nicole Hunn. For this reason, she doesn’t allow any gluten-containing ingredients or foods into her home. It’s too difficult to avoid contamination. When baking something gluten free for a friend or family member, keep in mind that it’s important to avoid gluten in the kitchen space and cooking tools as well as in the ingredients.



flour replacements, such as rice flour, contain only starch. So a recipe that uses one of these flours often needs another ingredient to play gluten's gluey role. Xanthan gum or guar gum can do the trick. Both make the food stickier so it doesn't crumble as much.

Yael Vodovotz and her team have run experiments to test potential gluten replacements. In one, they tested egg whites and soy protein. They made eight different versions of a rice flour bread recipe. Six contained different amounts of either soy protein or egg whites. Two control loafs contained neither protein. The team found that egg whites came closest to mimicking gluten. "But you have to add a lot of freeze-dried egg whites," says Vodovotz. And the quality of the bread still wasn't quite right. Still, the results of the experiment helped a company called Around the World Gourmet improve its gluten-free products.

## Reimagining Food

Clearly, gluten's chemical shoes are tough to fill. But trying to replace gluten isn't the only solution. Nicole Hunn says that she started out trying to mimic regular flour in her recipes. But she's moved beyond that. "Instead of finding a different key that fits in the same lock, I want to find another way in." She now looks for ways to open up cupcakes, cookies, or brownies with unusual ingredients. Often, her recipes contain no flour at all. She's made a flourless cake from quinoa and flourless brownies from black beans. The black bean idea "sounded horrible to me," she says. But the chocolate in the recipe masks the bean flavor. "My family loves it."

In general, cookies and cakes are easier to successfully reimagine than bread. Chocolate can help cover unusual flavors. Sugar helps absorb water. But in bread, it's tough to compete with those stretchy gluten bubbles.

Vodovotz mentions another creative solution. Scientists may be able to produce a form of gluten that's safe for people with celiac disease. Gluten is a complex substance made up of many components. Just one component may be responsible for triggering the disease. Researchers are working on modifying wheat's genes. Their goal is to take out the part of the gluten that causes problems. What would success look like? One day, people like Hunn's son may eat gluten cupcakes at a birthday party.

**Kathryn Hulick** would have a hard time going gluten free. Bread and pasta are her favorite foods! She's a contributing editor to *Muse* and the author of many books for kids and teens.

## RECIPE

### Black Bean Brownies

*Recipe courtesy of Nicole Hunn,  
[glutenfreeonashoestring.com](http://glutenfreeonashoestring.com)*



### Ingredients

- » Cooking oil spray
- » 1 15-ounce can black beans, drained and rinsed well
- » 2 eggs (100 g, weighed out of shell), at room temperature
- » 1/4 cup (56 g) neutral oil like grapeseed, canola, or vegetable
- » 2 teaspoons pure vanilla extract
- » 2 tablespoons strong brewed coffee (can use decaf)
- » 3/4 cup (60 g) unsweetened cocoa powder (natural or Dutch-processed)
- » 1/2 teaspoon baking soda
- » 1/4 teaspoon kosher salt
- » 3/4 cup (164 g) packed light brown sugar
- » 3 ounces semi-sweet or dark chocolate chips (optional)

### Directions

1. Preheat your oven to 325°F. Line an 8-inch square baking pan with parchment paper. Spray the paper with cooking oil, and set the pan aside.
2. In a blender or food processor, place the drained and rinsed beans, eggs, oil, vanilla and coffee, and blend until smooth. In a large bowl, place the cocoa powder, baking soda, salt, and brown sugar, and whisk to combine well, breaking up any lumps in the brown sugar. Create a well in the center of the cocoa powder mixture and add the processed bean mixture. Mix until well combined. Add about half of the (optional) chocolate chips to the batter and mix to combine. The mixture will be thickly pourable.
3. Pour the mixture into the prepared baking pan and spread into an even layer. Sprinkle the remaining (optional) chocolate chips evenly on top of the batter, and press down gently to help the chips adhere.
4. Place the baking pan in the center of the preheated oven and bake until the surface of the brownies springs back when pressed gently with a finger, about 25 minutes. Remove pan from the oven, place on a wire rack, and allow brownies to cool until no longer hot to the touch. Remove brownies from the pan and slice into squares with a sharp knife. For cleaner slicing, cover and chill brownies in the pan for 30 minutes before removing from the pan and slicing.