

Gluten-Free Flour Guide

Children's National Health System Celiac Disease Program



There are dozens of gluten-free flours and grains that can be blended together to create tasty baked goods. This handout provides information about the most popular products and some tips for using them in your every day cooking.



Almond Flour

- Made from raw, blanched whole almonds that have been ground into a fine powder
- Packed with the following:
 - Manganese: is good for blood sugar control and bone health
 - Vitamin E: helps prevent heart and blood diseases and may help treat diabetes and related complications
 - Monounsaturated fats: can help reduce bad cholesterol levels and decrease the risk of heart disease and stroke
- Replacing 25 percent of the flour in baking with almond meal will add a soft texture and reduce total carbohydrates

- Use almond flour for making French macarons, pie crusts, cakes, cookies, pancakes, and quick breads. Or, use almond flour in place of breadcrumbs.
- *High in protein and low in carbohydrates (1/4 cup = 3g fiber, 4g protein)*

Coconut Flour

- Ground from dried, defatted coconut meat
- Due to its high fiber content, coconut flour requires an equal ratio of liquid to flour for best results
- Coconut flour can replace up to 20 percent of the flour in a recipe, but it needs an equal amount of liquid to compensate
- Try blending coconut flour with other naturally gluten-free flours like almond or buckwheat flour
- Gives baked goods a very rich texture and adds natural sweetness only half as much sugar is needed when using coconut flour
- *High fiber, low in carbohydrates (1/4 cup = 11g fiber, 5g protein 2g sat fat)*

Brown Rice Flour and White Rice Flour

- Made from finely stone-ground white and brown rice grains, the two can be used interchangeably in recipes
- Brown rice flour is high in protein, iron, fiber, vitamin B, contains the healthy rice bran, and will help add a darker color to baked goods
- White rice flour is made from refined brown rice and can be slightly gritty when used alone
- Brown rice flour provides 20 percent of the recommended amount of iron for men and 9 percent for women
- *Brown rice flour: 1/4 cup = 2g fiber / White rice flour: 1/4 cup = 1g fiber*

Teff Flour

- Light, uniquely flavored, and 100 percent whole grain flour
- Traditionally used to make Injera, an Ethiopian flat bread
- The smallest grain in the world; about 100 grains of teff are the size of a single kernel of wheat
- Compared to other grains, it has a much larger percentage of bran and germ so it's a good source of dietary fiber, protein, iron, amino acids, vitamin C, and calcium
- *¼ cup = 5g fiber, 5g protein*

Millet Flour

- Lends a delicate, cake-like crumb to baked goods
- Replace up to 25 percent of the flour in a recipe with millet flour for added nutrition
- Millet flour adds whole grain nutrition and has a mild flavor; use in combination with other gluten-free flours like sorghum flour and almond flour
- A good source of protein, essential amino acids, and dietary fiber
- *¼ cup = 3g protein, 4g fiber*

Sorghum Flour

- Sorghum is a staple food in India and Africa; the whole grain is ground into a flour
- The starch and protein in sorghum takes longer to digest than other flours, which can be helpful for those with diabetes
- Traditionally used to make pancakes, porridges, and flatbread but is becoming more commonly used in baked goods
- Sorghum flour has a smoother texture that is great for baking
- Often malted and then used to make gluten-free beer. In this case, malting refers to converting the sorghum starch into a safe gluten-free sugar
- *Sorghum flour is high in protein, iron and dietary fiber (¼ cup = 3g fiber, 4g protein)*

Tapioca Flour

- Slightly sweet and very starchy; contains no discernible taste or smell
- Combine with other flours like quinoa flour or brown rice flour
- Made from the starch extracted from the South American cassava plant
- Tapioca helps add crispness to crusts and sponginess to baked goods
- It is an extremely smooth flour, which makes for a great thickener in sauces, pies, and soups
- Can be used to replace cornstarch (use 2 tablespoons tapioca flour for every 1 tablespoon cornstarch)
- *Low nutrient value (¼ cup = 0g fiber, 0g protein)*

Soy Flour

- Made from soybeans ground into a fine powder
- Gives lightness to baked goods and has a nutty flavor
- Can replace up to 30 percent of the flour in a recipe
- Baked goods made with soy flour tend to brown more quickly, so please be careful!
- Helps lighten the texture of bread; add 1 tablespoon of soy flour to a bread recipe
- *High in fiber and protein. (¼ cup = 3g fiber, 10g protein)*

Buckwheat Flour

- Made from whole ground buckwheat seeds; related to the rhubarb plant
- Contains more protein than rice, millet, or corn and is packed with essential amino acids; the high levels of protein help to stabilize blood sugar levels, making it great for people on a low-glycemic diet
- Buckwheat also is a good source of protein and calcium
- Use 50 percent buckwheat flour in most recipes; try a 100 percent replacement with recipes like pancakes
- *Good source of protein and fiber (¼ cup = 4g fiber, 4g protein)*

Flour Nutrition Comparison

Ingredient	Fiber (per ¼ cup)	Protein (per ¼ cup)	Carbohydrates (per ¼ cup)
Almond Flour	3g	4g	6g
Coconut Flour	11g	5g	8g
Brown Rice Flour	2g	3g	31g
White Rice Flour	1g	2g	32g
Teff Flour	5g	5g	29g
Millet Flour	4g	3g	22g
Sorghum Flour	3g	4g	25g
Tapioca Flour	0g	0g	26g
Soy Flour	3g	10g	8g
Corn/Potato	0g	0g	7g/10g
Quinoa Flour	2g	4g	18g
Buckwheat Flour	4g	4g	21g

Gluten-Free, All-Purpose Flours

Not all gluten-free flours are created equal. Some are high in starchy flours like brown and white rice flours, cornstarch, tapioca flour, and potato starch. Some contain small amounts of gums like xanthan gum or guar gum and others are a blend of high-protein flours like chickpea, millet, teff, and amaranth. They each have different binding properties, weights, and rising abilities, so it's very important to understand the type of flour you're about to buy to make sure it syncs with your recipe.

Purchasing All-Purpose, Gluten-Free Flour Blends

There are dozens of gluten-free, all-purpose flours available in grocery stores all over the world. Picking the right one can often be a challenge. Look for a flour blend that has a variety of ingredients to make a balanced mix. We like a blending of high-starch flours, high-protein flours, and those that help keep baked goods moist. The blends we use must contain xanthan gum or guar gum as a binder. Without the added gum, you must buy a separate gum and add it in yourself, which defeats the purpose of purchasing "all-purpose flour."

Making Your Own Gluten-Free Flour Blend

If you're a total foodie or just one of those people who likes to maintain complete control in the kitchen, making your own gluten-free, all-purpose blend might be the right way to go. If you choose this method, make large batches ahead of time, and store them in an airtight container so that you have all-purpose flour to use at a moment's notice. You never know when you may need to make an impromptu batch of chocolate chip cookies!

Adding a Gum to Your All-Purpose Flour Blend

A gluten-free, all-purpose blend is most effective when it contains a gum. The gums provide several crucial elements to make your recipes turn out just right, such as:

- **The "Doughy" Factor:** A gum helps mimic the missing gluten in gluten-free flours. Gluten is what makes dough elastic, and in its absence, we have to find a replacement. Xanthan or guar gum provide this "doughy" property in gluten-free baking.
- **Emulsifier:** A gum can work as an emulsifier, which means it can help liquids stick together that might otherwise not stick.
- **Thickener:** A gum works to thicken batter to become more viscous.

Xanthan Gum vs. Guar Gum

Both ingredients are frequently used in gluten-free baking, and it is often confusing why a recipe uses one over another. They both serve the same general purpose as thickeners and emulsifiers. On the most basic level, they keep your baked goods stuck together. The greatest difference is in how each is made.

- Guar Gum is made from a seed native to tropical Asia and works best in cold cooking (salad dressings, ice cream, custards, etc).
- Xanthan Gum is made from a microorganism called *Xanthomonas Campestris* (lactose or sugar) and works best in baking and hot food preparations.
- While the amount of each gum varies per recipe, you want approximately $\frac{1}{4}$ - $\frac{1}{2}$ teaspoon per cup of flour.

GLUTEN-FREE FLOUR BLENDS TO TRY AT HOME

Basic All-Purpose, Gluten-Free Flour Blend

This is a starchy flour blend that's easy to make and is one of the most economical all-purpose blends you'll find. The ingredients are easily purchased in most mainstream grocery stores. Simply blend the four ingredients together, and store in an airtight container for up to one month. Use as a one-to-one replacement in baked good recipes.

4 cups brown rice flour
1½ cups cornstarch
¼ cup tapioca flour
2 teaspoons xanthan gum

High Protein and Fiber All-Purpose Blend

The sweet, white sorghum flour brings protein, iron, antioxidants, and dietary fiber to this nutrient-packed flour blend. The tapioca will add a thin and sturdy crust to your baked goods, and the coconut flour offers a unique and slightly sweet moistness. Simply blend the four ingredients together, and store in an airtight container for up to one month. Use as a one-to-one replacement in baked good recipes.

3 cups sweet white sorghum flour
3 cups tapioca flour
1 cup coconut flour
3 teaspoons xanthan gum

High-Protein, Low-Glycemic, All-Purpose Blend

This flour blend is great for bakers looking to cut down on carbohydrates but still boost their protein intake. Buckwheat flour — which is actually the seed of a plant—contains more protein than rice, millet, or corn and is packed with essential amino acids. The high levels of protein help to stabilize blood sugar levels, making it great for people on a low-glycemic diet. Almond flour is naturally low in carbohydrates and adds even more protein to this wonderful blend. Simply mix the four ingredients together, and store in an airtight container for up to one month. Use as a one-to-one replacement in baked good recipes, specifically quick breads and cakes like carrot or apple cake.

3 cups buckwheat flour
2 cups almond flour
½ cup coconut flour
2 teaspoons xanthan or guar gum



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