

ALTERNATIVES FOR GLUTEN-FREE FLOUR

Adapted from: http://www.mapleshores.ca/site/assets/files/1029/wheat_flour_alternatives.pdf

The information below will give you a better idea of the different types of gluten-free flours. All the different options in flour may seem overwhelming, but just take using them one step at a time and as an opportunity to learn and experiment. All gluten-free flours are missing the key element in other flours that provides rising and elasticity.

This list, though incomplete, gives you OVER 35 options for gluten-free flour.

Flour Type	Density of Flour	Comments	Best Use	Brands	Exchange for Percentage in Flour Recipe	Example for 1 Cup of Flour
Almond Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Nut flour • Can be milled into flour • Best if refrigerated 	<ul style="list-style-type: none"> • Quick breads, pancakes, waffles, desserts 	<ul style="list-style-type: none"> • Bob's Red Mill <ul style="list-style-type: none"> • Wellbee's • Anthony's • Simple Mill 	50% to 100%	½ cup to 1 cup
Amaranth Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Whole grain flour • Earthy taste • Can be milled into flour • Complements brown rice flour and quinoa 	<ul style="list-style-type: none"> • Pancakes, biscuits, flatbreads, pastas 	<ul style="list-style-type: none"> • Bob's Red Mill <ul style="list-style-type: none"> • Erbology 	25%	¼ cup
Arrowroot Starch/Flour	<ul style="list-style-type: none"> • Light 	<ul style="list-style-type: none"> • Starch flour • Substitute for cornstarch • Thickener—combines well w/ non-gluten flours to give them cohesion; complements brown rice flour 	<ul style="list-style-type: none"> • Biscuits, puddings, jellies, soups, sauces, milk, broths 	<ul style="list-style-type: none"> • Bob's Red Mill <ul style="list-style-type: none"> • Anthony's • Feel Good Organics 	25% to 50%	¼ cup to ½ cup
Green Banana Flour	<ul style="list-style-type: none"> • Light 	<ul style="list-style-type: none"> • Starch flour • Made from unripe green bananas • Does not have a banana taste, mild flavor 	<ul style="list-style-type: none"> • Muffins, pancakes, breads, cookies, desserts, smoothies 	<ul style="list-style-type: none"> • Let's Do Organic <ul style="list-style-type: none"> • Blue Lily • Zuvii 	25% to 50%	¼ cup – ½ cup
Black Bean Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Bean Flour 	<ul style="list-style-type: none"> • Cakes, brownies, burgers, tortillas 	<ul style="list-style-type: none"> • Bob's Red Mill <ul style="list-style-type: none"> • Barry Farm 	25% to 50%	¼ cup to ½ cup
Brown Rice Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Whole grain flour 	<ul style="list-style-type: none"> • Breeding for 	<ul style="list-style-type: none"> • Anthony's 	50%	½ cup

		<ul style="list-style-type: none"> • Stronger, nuttier flour • Can be milled into flour • Best if refrigerated • Research information on high arsenic levels 	<p>foods, breads, muffins, cookies</p>	<ul style="list-style-type: none"> • Hodgson Mill • Bob's Red Mill • Authentic Foods 		
Buckwheat Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Whole grain flour • Makes a dark, heavy bread • Complements rice flour • Best if refrigerated 	<ul style="list-style-type: none"> • Pancakes, muffins, rolls, breads, pancakes 	<ul style="list-style-type: none"> • Arrowhead Mills • Anthony's • Bob's Red Mill • Haldeman Mills • Hodgson Mill 	50% to 100%	½ cup to 1 cup
Cashew Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Nut flour • Can burn more easily • Best if refrigerated 	<ul style="list-style-type: none"> • Cookies, crusts, muffins, pancakes, quick breads 	<ul style="list-style-type: none"> • Wellbee's • Live Superfoods • Wild Tree Farms 	50%	½ cup
Cassava Flour	<ul style="list-style-type: none"> • Light 	<ul style="list-style-type: none"> • White/starch flour • Neutral in taste • Good choice for people with diabetes, high cholesterol, and high blood pressure 	<ul style="list-style-type: none"> • Cookies, brownies, pancakes, denser breads, tortillas, sauces 	<ul style="list-style-type: none"> • Otto's • Anthony's • Terrasoul Superfoods 	25% to 50%	¼ cup to ½ cup
Chia Seed Flour/Meal	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Thickener • Can be used as an egg substitute • Can grind whole seed just before using it • Best if refrigerated 	<ul style="list-style-type: none"> • Bread, cookies, muffins, smoothies, egg replacement 	<ul style="list-style-type: none"> • Viva • Spectrum • Navitas • Gerb's 	25%	¼ cup
Chestnut Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Nut flour • Slight nutty flavor • Can burn more easily 	<ul style="list-style-type: none"> • Breads, pie crust, cakes, crepes, muffins, sauces, soups 	<ul style="list-style-type: none"> • Hoosier Hill Farm • Farina di Castagne 	50%	½ cup
Coconut Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Nut flour • Add an equal amount of water to flour: for example, to 4 Tbsp of coconut flour, add 4 Tbsp water/liquid 	<ul style="list-style-type: none"> • Breads, brownies, cookies, cupcakes, muffins, pancakes, waffles 	<ul style="list-style-type: none"> • Nutiva • Anthony's • Bob's Red Mill • Terrasoul Superfoods • Arrowhead Mills 	25%	¼ cup

Corn Flour/Meal	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Whole grain flour • Makes a light bread mix • Combine w/ equal parts of cold water before adding as a thickener • Best combined w/ small amounts of other flours 	<ul style="list-style-type: none"> • Muffins, pancakes, cornbread, biscotti, polenta, puddings 	<ul style="list-style-type: none"> • Bob's Red Mill • Arrowhead Mills <ul style="list-style-type: none"> • Great River • War Eagle Mill • Palmetto Farms 	25% to 50 %	¼ cup to ½ cup
Cornstarch	<ul style="list-style-type: none"> • Light 	<ul style="list-style-type: none"> • Starch flour • Thickener 	<ul style="list-style-type: none"> • Broths, casseroles, gravies, puddings, sauces, soups 	<ul style="list-style-type: none"> • Anthony's • Bob's Red Mill <ul style="list-style-type: none"> • Argo • Frontier Herb 	25%	¼ cup
Corn Masa Harina Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Nixtamalized (ground corn that has been soaked in lime, making the nutrients more absorbable) • Finer blend than cornmeal 	<ul style="list-style-type: none"> • Tortillas, cornbread, tamales, cookies 	<ul style="list-style-type: none"> • Bob's Red Mill • Gold Mine 	25%	¼ cup
Fava Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Bean flour • Often mixed with garbanzo bean flour 	<ul style="list-style-type: none"> • Breads, cakes, cookies, crusts 	<ul style="list-style-type: none"> • Barry Farm Foods • Bob's Red Mill 	25%	¼ cup
Flaxseed Flour/Meal	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Nutty taste • Can grind whole grain just prior to using it • Needs refrigerated 	<ul style="list-style-type: none"> • Muffins, brownies, pizza crust, smoothies, egg replacement 	<ul style="list-style-type: none"> • Bob's Red Mill <ul style="list-style-type: none"> • Spectrum • Viva 	25%	¼ cup
Garbanzo Bean Flour (Chickpea Flour)	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Bean flour • Good binding flour • Use w/ other flours; complements sorghum and brown rice flour 	<ul style="list-style-type: none"> • Breads, cakes, muffins, pancakesb 	<ul style="list-style-type: none"> • Bob's Red Mill • Authentic Foods 	25% to 50%	¼ cup to ½ cup

Green Pea Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Bean flour 	<ul style="list-style-type: none"> • Cakes, cookies, brownies, sauces, soups 	<ul style="list-style-type: none"> • Bob's Red Mill • Barry Farm 	25%	¼ cup
Hazelnut Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Nut flour 	<ul style="list-style-type: none"> • Breads, cookies, crusts, biscotti, breading for meats, smoothies 	<ul style="list-style-type: none"> • Sincerely Nuts • Bob's Red Mill 	25% to 50%	¼ cup to ½ cup
Hemp Seed Flour/Meal	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Strong nutty/earthy flavor • Needs refrigerated 	<ul style="list-style-type: none"> • Breads, brownies, cookies, muffins, smoothies 	<ul style="list-style-type: none"> • Bulgar Herbs • Yorkshire Hemp 	25% to 33%	¼ cup to 1/3 cup
Millet Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour 	<ul style="list-style-type: none"> • Biscuits, breads, cakes, cookies, muffins 	<ul style="list-style-type: none"> • Arrowhead Mills • Bob's Red Mill 	25% to 33%	¼ cup to 1/3 cup
Oat Flour (certified gluten-free only)	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Light texture adds moisture to baked goods; best combined w/ corn or rice flours • Use only 20% oat flour in recipe 	<ul style="list-style-type: none"> • Biscuits, breads, cakes, cookies, muffins 	<ul style="list-style-type: none"> • Bob's Red Mill • Gluten-Free Prairie <ul style="list-style-type: none"> • Montana • GF Harvest 	25% to 50%	¼ cup to ½ cup
Potato Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • White flour/starch • Absorbs large amount of water • Not the same as potato starch • Strong potato flavor • Best mixed with multiple gluten-free flours • Thickener 	<ul style="list-style-type: none"> • Breads, rolls, gravies, sauces, soups 	<ul style="list-style-type: none"> • Bob's Red Mill • Authentic Foods 	12.5% to 25%	⅛ cup to ¼ cup
Potato Starch	<ul style="list-style-type: none"> • Light 	<ul style="list-style-type: none"> • Starch flour • Not the same as potato flour • Thickener 	<ul style="list-style-type: none"> • Baked goods, gravies, puddings, sauces, soups 	<ul style="list-style-type: none"> • Anthony's <ul style="list-style-type: none"> • Ener-G • Authentic Foods 	25% to 50%	¼ cup to ½ cup

Pumpkin Seed Flour/Meal	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Distinctive flavor • Needs refrigerated 	<ul style="list-style-type: none"> • Breads, pie crust 	<ul style="list-style-type: none"> • Gerb's 	25%	¼ cup
Quinoa Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Best combined w/ other flours • High in protein, calcium, and iron 	<ul style="list-style-type: none"> • Biscuits, breads, cakes, cookies, muffins, pancakes, waffles, breading for meats, thickener 	<ul style="list-style-type: none"> • Bob's Red Mill • Namaste 	25% to 50%	¼ cup to ½ cup
Sorghum Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Needs refrigerated 	<ul style="list-style-type: none"> • Pancakes, waffles, biscuits, breads, cakes, cookies, muffins 	<ul style="list-style-type: none"> • Authentic Foods • Bob's Red Mill • True Sprouted Flour 	25% to 50%	¼ cup to ½ cup
Soy Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Bean flour • Makes bread or baked goods more moist and smooth • Nutty flavor; too much can yield bitter product • Best if added in small amounts to other flours • Browns quickly; decrease baking temperature by 25 degrees 	<ul style="list-style-type: none"> • Biscuits, bread, cakes, cookies, muffins 	<ul style="list-style-type: none"> • Bob's Red Mill 	25%	¼ cup
Sweet Potato Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • Whole grain flour 	<ul style="list-style-type: none"> • Pancakes, breads, cakes, cookies, muffins, biscuits, thickener 	<ul style="list-style-type: none"> • Healthier Way • Barry Farm 	25% to 50%	¼ cup to ½ cup
Sweet Rice Flour	<ul style="list-style-type: none"> • Heavy 	<ul style="list-style-type: none"> • White/starch flour • Thickener 	<ul style="list-style-type: none"> • Cakes, cookies, gravies, puddings, soups, sauces 	<ul style="list-style-type: none"> • Authentic Foods • Bob's Red Mill • Ener-G 	50%	½ cup
Sunflower Seed Flour/Meal	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour • Needs refrigerated 	<ul style="list-style-type: none"> • Biscuits, breads, cakes, cookies, muffins, pancakes, waffles 	<ul style="list-style-type: none"> • Gerb's 	25%	¼ cup

Tapioca Starch/ Flour	<ul style="list-style-type: none"> • Light 	<ul style="list-style-type: none"> • Starch flour • Excellent substitute for arrowroot starch or cornstarch • Thins if reheated • Combines well w/ non-gluten flours to give them cohesion • Thickener 	<ul style="list-style-type: none"> • Biscuits, breads, cakes, cookies, gravies, puddings, soups, sauces 	<ul style="list-style-type: none"> • Arrowhead Mills • Anthony's • Authentic Foods • Bob's Red Mill 	25%	¼ cup
Teff Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Whole grain flour 	<ul style="list-style-type: none"> • Biscuits, breads, cakes cookies, muffins, pancakes 	<ul style="list-style-type: none"> • Bob's Red Mill • Haldeman Mills • Anthony's • Maskal Teff 	50%	½ cup
Tigernut Flour	<ul style="list-style-type: none"> • Light 	<ul style="list-style-type: none"> • Comes from vegetable root • Sweet and nutty flavor 	<ul style="list-style-type: none"> • Breads, brownies, cookies, pancakes, pudding 	<ul style="list-style-type: none"> • Organic Gemini • Anthony's • Tiger Nuts 	25% to 50%	¼ cup to ½ cup
Walnut Flour/Meal	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Nut flour • Nutty flavor • Can burn more easily 	<ul style="list-style-type: none"> • Biscuits, breads, cakes, cookies, muffins, pancakes 	<ul style="list-style-type: none"> • Bulgar Herbs • Wild Tree Farms • Oh! Nuts 	25%	¼ cup
White Bean Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Bean flour • Thickener 	<ul style="list-style-type: none"> • Gravies, sauces 	<ul style="list-style-type: none"> • Barry Farms • Bob's Red Mill 	25%	¼ cup
White Rice Flour	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • White/starch flour • Thickener 	<ul style="list-style-type: none"> • Breads, cookies, crusts, gravies, puddings, sauces 	<ul style="list-style-type: none"> • Arrowhead Mills • Authentic Foods • Bob's Red Mill 	50%	½ cup

What is the Difference Between Flour and Starch:

Flour is considered to be minimally processed, while a starch has gone through the highest amount of processing before turning into a sugar. Although both may come from the same plant (like corn flour and cornstarch) they are processed to a completely different level. Starches play an important role in gluten-free cooking but contain the least amount of nutrition. As you are learning about the different gluten-free flours and starches, try to focus on including ones that retain a high nutritional content. With celiac disease and gluten intolerance you have been deprived of nutrients for an indefinite amount of time and it is vital to replenish your body with those nutrients.

What Is Density of Flour?

Adapted from: <http://www.forkandbeans.com/2013/12/30/guide-gluten-free-flours/>

Flours are separated into three categories based on how dense and nutritious they are and how easy they are to use alone. Below gives a better description of the classification.

1. **Light:** All starches fall under this category. They are a must when creating the perfect gluten-free flour blend.
2. **Medium:** These flours are great to pair with starches or light-density flour. They are a bit lighter, creating a good blend when paired with a starch.
3. **Heavy:** These flours are nutritious but dense. Rarely used alone, they create a good blend when mixed with a medium-density flour.

Rules to Combining Flours

Adapted from: <http://www.forkandbeans.com/2013/12/30/guide-gluten-free-flours/>

Although creating different combinations, instead of just using one type of flour, will give you the best outcome, there will be trial and error.

What you use will depend on what your taste buds want and your purpose. The following combinations are great to use with the different type of gluten-free flours that are available. Feel free to try different blends, and don't get discouraged if a blend doesn't turn out well, as there are countless options out there.

Combination # 1:

- 1 medium flour + 1 or 2 starches

Combination # 2:

- 2 medium flours + 1 or 2 starches

Combination # 3:

- 1 medium flour + 1 heavy flour + 1 or 2 starches

Combination # 4:

- A variety of medium and heavy flours + 1 or 2 starches

Combination # 5:

- 3 parts white or brown rice flour
- 2 parts potato starch
- 1 part tapioca flour/starch

Prepared Gluten-Free Flour Blend Recipes

#1 - Gluten-Free All-Purpose Flour Blend

Retrieved from: <http://www.forkandbeans.com/2013/12/30/guide-gluten-free-flours/>

- 3 cups sorghum flour
- 3 cups superfine brown rice flour
- 1½ cup potato starch
- 1 ½ cup arrowroot starch

#2 - Gluten-Free All-Purpose Flour Blend

Retrieved from: http://allrecipes.com/recipe/242067/best-all-purpose-gluten-free-flour-blend/?utm_source=pinterest&utm_medium=social&utm_campaign=alr_540783703_ar_dailycontent

- 5 cups white rice flour
- 3½ cups corn flour
- 3½ cups arrowroot flour/starch
- 2½ cups brown rice flour
- 1½ cup sorghum flour
- 4 teaspoons xanthan gum

#3 - Gluten-Free All-Purpose Flour Blend

Retrieved from: <http://dish.allrecipes.com/how-to-use-gluten-free-flour/>

- ¼ cup soy flour
- ¼ cup tapioca flour
- ½ cup brown rice flour

#4 - Gluten-Free All-Purpose Flour Blend

Retrieved from: <http://dish.allrecipes.com/how-to-use-gluten-free-flour/>

- 6 cups white rice flour
- 2 cups potato starch
- 1 cup tapioca flour

#5 - Gluten-Free All-Purpose Flour Blend

Retrieved from: <https://www.glutenfreeandmore.com/resources/food-allergy-substitutions.html>

- ½ cup rice flour
- ¼ cup tapioca starch/flour
- ¼ cup cornstarch or potato starch

#6 - Gluten-Free High-Fiber Flour Blend

Retrieved from: <https://www.glutenfreeandmore.com/resources/food-allergy-substitutions.html>

- 1 cup brown rice flour or sorghum flour
- ½ cup teff flour
- ½ cup millet flour
- ⅔ cup tapioca starch/flour
- ⅓ cup cornstarch or potato starch

This blend works for breads, pancakes, snack bars, and cookies that contain chocolate, warm spices, raisins, or other fruits. It is not suited to delicately flavored recipes, such as sugar cookies, crepes, cream puffs, birthday cakes, or cupcakes.

#7 - Gluten-Free High-Protein Flour Blend

Retrieved from: <https://www.glutenfreeandmore.com/resources/food-allergy-substitutions.html>

- 1¼ cups bean flour (your choice), chickpea flour, or soy flour
- 1 cup arrowroot starch, cornstarch, or potato starch
- 1 cup tapioca starch/flour
- 1 cup white or brown rice flour

This nutritious blend works best in baked goods that require elasticity, such as wraps and pie crusts.

#8 - Gluten-Free Self-Rising Flour Blend

Retrieved from: <https://www.glutenfreeandmore.com/resources/food-allergy-substitutions.html>

- 1¼ cups white sorghum flour
- 1¼ cups white rice flour
- ½ cup tapioca starch/flour
- 2 teaspoons xanthan or guar gum
- 4 teaspoons baking powder
- ½ teaspoon salt

Use this blend for muffins, scones, cakes, cupcakes, or any recipe that uses baking powder for leavening.

Alternative Gluten-Free Thickeners

The following quantities equal 1 tbsp of wheat flour:

- Arrowroot flour/starch - ½ tbsp
- Cornstarch - 1 tbsp
- Oatmeal flour - 1 tbsp
- Potato flour/starch - ½ tbsp
- Rice flour - ½ tbsp
- Tapioca flour/starch - ½ tbsp

How to Use Xanthan or Guar Gum

Retrieved from: <https://www.glutenfreeandmore.com/resources/food-allergy-substitutions.html>

Gum (xanthan or guar) is the key to successful gluten-free baking. It provides the binding needed to give the baked product proper elasticity, keeping it from crumbling.

- Add ½ teaspoon xanthan or guar gum per cup of flour blend to make cakes, cookies, bars, muffins and other quick breads.
- Add 1 teaspoon per cup of flour blend to make yeast bread, pizza dough, or other baked items that call for yeast.

Note: If you purchase a commercial flour blend, read the ingredient list carefully. Some blends contain salt and xanthan or guar gum. If so, there is no need to add more.

The Best Alternatives for Milk, Buttermilk, Yogurt, Butter, Eggs, and Nuts:

Retrieved from: <https://www.glutenfreeandmore.com/resources/food-allergy-substitutions.html>

1. Milk

Replace 1 cup cow's milk with one of the following:

- 1 cup soy milk (plain)
- 1 cup rice milk
- 1 cup fruit juice
- 1 cup water
- 1 cup coconut milk
- 1 cup goat's milk, if tolerated
- 1 cup hemp milk

2. Buttermilk

Replace 1 cup buttermilk with one of the following and include 1 tablespoon lemon juice or 1 tablespoon white vinegar (Let stand until slightly thickened):

- 1 cup soy milk
- 1 cup coconut milk
- 1 cup almond milk
- ⅞ cup rice milk
- ⅞ cup fruit juice
- ⅞ cup water

3. Yogurt

Replace 1 cup yogurt with one of the following:

- 1 cup soy yogurt or coconut yogurt
- 1 cup soy sour cream
- 1 cup unsweetened applesauce
- 1 cup fruit puree

4. Butter

Replace 8 tablespoons (1 stick) butter with one of the following:

- 8 tablespoons (1 stick) Fleischmann's unsalted margarine
- 8 tablespoons Earth Balance (Non-Dairy) Buttery Spread
- 8 tablespoons Spectrum Organic Shortening
- 8 tablespoons vegetable or olive oil

For reduced fat:

- 6 tablespoons unsweetened applesauce + 2 tablespoons fat of choice

5. Eggs

- Replace 1 large egg with one of the following:
- 3 tablespoons unsweetened applesauce (or other fruit puree) + 1 teaspoon baking powder
- 1 tablespoon flax meal, chia seed, or salba seed + 3 tablespoons hot water. (Let stand, stirring occasionally, about 10 to 15 minutes or until thick. Use without straining.)
- Egg Replacer, according to package directions
- 4 tablespoons pureed silken tofu + 1 teaspoon baking powder

Replacing more than two eggs will change the integrity of a recipe. For recipes that call for a lot of eggs, like a quiche, use pureed silken tofu. Because egg substitutions add moisture, you may have to increase baking times slightly.

Note: To replace one egg white, dissolve 1 tablespoon plain agar powder into 1 tablespoon water. Beat, chill for 15 minutes, and beat again.

6. Nuts

Replace tree nuts or peanuts with an equal amount of the following:

- Toasted coconut
- Sunflower seeds
- Toasted sesame seeds
(use only 2 to 3 tablespoons)
- Crushed cornflakes
- Crushed crispy rice cereal
- Crushed potato chips
- Pumpkin seeds
- 1 teaspoon xanthan gum for every 1½ cups flour mixture

Additional Helpful Hints

- The best flour comes from stone-ground mills that do not overheat the flours, as that helps retain the nutrients
- Flours should be bought from a store that has a high turnover
- Gluten-free flours have a shorter shelf life; keeping them in a refrigerator or freezer will extend that shelf life by several months
- To store, remove flour from its original package and refrigerate or freeze in a glass, airtight container
- Do not be concerned if batter appears thinner than wheat batters; this is common
- Refrigerating dough approximately 30 minutes will improve texture and give a better rise
- Don't bake anything thicker than 4 inches
- When baking, lower the temperature a little, by about 25 degrees; this will help prevent burning
- Baking time is usually longer, especially if egg or milk is eliminated from the recipe

Types of Gluten-Free Flours

Adapted from: Recipetips.com, <http://www.recipetips.com/kitchen-tips/t--1040/flour-nutritional-facts.asp>,
and What's Cooking America, <http://whatscookingamerica.net/Bread/FlourTypes.htm>

Most types of flour are composed mainly of carbohydrates, but the quantity of carbohydrates varies according to the type of substance used to create the flour. Some types of flour, especially those ground from nuts, contain more fat and protein than carbohydrates, which is why it is difficult to produce nut flours that are as dry and finely ground as flour produced from grains. Various types of flour milled from grains (especially wheat) are the types to which most people are accustomed. However, flour varieties ground from seeds, legumes, tubers, and nuts are often used for baking and thickening and have an equal number of nutritional benefits. This list is not exhaustive. Since flour is a milled product, it is important to look for certified gluten-free flours, preferably produced in gluten-free facilities.

Almond Flour - Just a touch of this flour (about ¼ of a flour mixture) is all you need to add moistness, a little binding, a light almond flavor, and density to baked goods. It is especially good in pastry crusts, cookies, and quick breads.

Amaranth Flour - Amaranth is an ancient grain, and the word *amaranth* means "everlasting" in Greek. Amaranth contains more protein than any other gluten-free grain and more than wheat flour. Key nutrients include protein, calcium, iron, and zinc. You can substitute up to 20–25% of the flour used in your recipe with this flour.

Arrowroot Flour - Also known as arrowroot starch, arrowroot flour is high in fiber and easily digestible, so it is often used in breads and biscuits for small children. Key nutrients in arrowroot flour include calcium and potassium.

Buckwheat Flour - Buckwheat is a rich source of nutrients. Despite its name, it is not a type of wheat but is actually an herb plant related to rhubarb. Buckwheat flour is readily available, easy to work with, and has a nice nutty flavor. Key nutrients in buckwheat flour include protein, calcium, magnesium, phosphorus, B vitamins, and iron.

Chickpea Flour - Flour made from dried chickpeas (also known as garbanzo flour, gram flour, and besan) is used in many countries and is a staple ingredient in Indian, Pakistani, and Nepalese cuisines. You can use this flour as an egg substitute in vegan cookery and can substitute it for up to half the amount of all-purpose flour called for in a recipe. It is also very easy to make your own chickpea flour by processing dried chickpeas in your blender or food processor.

Coconut Flour - Coconut flour is ground from dried, defatted coconut meat. It is high in fiber, low in digestible carbohydrates, and has a very light coconut flavor. Coconut flour can replace up to 20% of the flour in a recipe, but you will need to add an

equal amount of liquid (oil) to the recipe to compensate, as this flour soaks up liquid. You will also need more eggs—usually double the eggs (or more).

Corn Flour - Corn flour is a good source of several important nutrients and contains protein, though not as much protein as many other types of flour. It is a powdery flour made of finely ground cornmeal milled from the whole kernel. Corn flour comes in yellow and white varieties and is useful for breading and in combination with other flours in baked goods. White corn flour is used as a filler, binder, and thickener in the cookie, pastry, and meat industries. Key nutrients in this flour include vitamin A, magnesium, and potassium.

Flaxseed Flour - Like whole flaxseed, flour made from flaxseed is an excellent source of cholesterol-reducing omega-3 fatty acids and soluble fiber. It is also one of the best sources of lignin, which may play a role in fighting certain types of cancer.

Millet Flour - Millet is one of the oldest foods known and is possibly the first cereal grain to be used for domestic purposes. Millet flour is most commonly used in desserts and sweetbreads, largely because of the grain's naturally sweet flavor. The natural alkalinity of millet flour makes it easily digestible, so it is very beneficial for people with ulcers and digestive problems. It is also believed to be one of the least allergenic varieties of flour. When substituting for wheat flour, it is usually best to start with about a 3-to-1 ratio of wheat to millet (Example: If a recipe calls for 1½ cup wheat flour, substitute ½ cup millet flour instead and combine with other gluten-free flours to equal the 1½ cup wheat flour). Key nutrients in millet flour include iron, magnesium, phosphorus, calcium, manganese, zinc, vitamin B, and fiber.

Oat Flour - Oat flour is very nutritious and a good source of the soluble fiber beta-glucan, which helps to decrease cholesterol in the blood. This flour tends to make baked goods moister than wheat flour. It is very easy to make your own oat flour by grinding dried oats in your blender. 1¼ cups rolled oats makes 1 cup oat flour. Key nutrients in this flour include B vitamins, vitamin E, copper, iron, zinc, magnesium, phosphorus, calcium, and thiamin.

Quinoa Flour - Quinoa flour is one of the most nutritious flours available. It contains about 17% high-quality protein, which is more protein than any grain flour and is equivalent to milk in protein quality. Quinoa, considered a grass/seed and not a grain, is a great addition to any diet and an ideal solution for those following a gluten-free, vegan, or vegetarian diet. You can substitute this flour for half of the all-purpose flour in many recipes or use it to completely replace wheat flour in cakes and cookie recipes. Key nutrients in quinoa flour include protein, iron, calcium, zinc, potassium, magnesium, phosphorus, and copper.

Rice Flour - Rice flour is made from finely milled white or brown rice. All types of rice flour are high in protein, but brown rice flour has a higher level of B vitamins, iron, and fiber than white rice flour, because the bran is included. White rice flour is lighter, milder, and easier to digest than wheat flour. Some people find white rice flour to be slightly gritty, but many find it

preferable to bean flours. It is great as a thickener in sauces. You can make your own rice flour by placing rice of your choice (white or brown) in your blender and processing it until it forms a powder. Key nutrients in rice flour include protein, calcium, phosphorus, potassium, thiamin, and niacin.

Sorghum Flour - Nutritionally, sorghum flour is similar to corn flour but has a higher concentration of protein. It is a very good substitute for wheat flour in many recipes, especially if combined with other, more dense flours. Key nutrients in sorghum flour include protein, calcium, iron, and potassium.

Soy Flour - Flour ground from soybeans is very high in protein and low in carbohydrates. It is available in full-fat, low-fat, and defatted versions. The full-fat variety contains about 20% fat and 35% protein, the low-fat variety contains about 6% fat and nearly 45% protein, and the defatted variety contains less than 1% fat and about 50% protein. Full-fat and low-fat soy flours work best in sweet, rich baked goods like cookies, soft yeast breads, and quick breads. Soy flour can be substituted for approximately 10–30% of the wheat or rye flour in recipes. Key nutrients in soy flour include protein, iron, calcium, potassium, phosphorus, and niacin.

Sweet Potato Flour - Sweet potato flour is high in fiber and contains a higher level of carbohydrates and a lower level of protein than common wheat flour. Key nutrients in sweet potato flour include potassium, vitamin A, vitamin C, and fiber.

Tapioca Flour - Also known as tapioca starch, tapioca flour is a starchy white flour with a slightly sweet flavor. Made from the starch extracted from the South American cassava plant, this flour helps bind gluten-free recipes and improves the texture of baked goods. It is an ideal thickening agent for a wide variety of baked goods, sauces, and desserts. This flour can also be used to replace cornstarch (use 2 tablespoons tapioca flour for each tablespoon cornstarch).

Teff Flour - Teff is an ancient and intriguing grain, tiny in size yet packed with nutrition. Because the teff grain is so small, there is no way to remove the husk, bran, and germ, which means that none of the nutrients are lost when the grain is ground into flour. Teff is simple to prepare and similar to millet or quinoa in cooking. It is a great addition to your diet for nutrition, taste, and variety. It is higher in protein than wheat and has a high concentration of a wide variety of nutrients. Since a teff grain is so small, the bulk of the grain is germ and brand. It is very high in fiber and is thought to benefit people with diabetes, as it helps control blood sugar levels. Teff flour is excellent for making dark breads and rye breads. Key nutrients in teff flour include calcium, iron, magnesium, zinc, thiamin, and fiber.

How to Make your Own Flours:

- **Almond Flour:**

To make almond meal, take raw almonds (almonds with skin on them), place in high output blender, food processor, or coffee grinder and grind until fine. Keep a close eye on it because if you blend too long it will turn into almond butter. You may have clumps that you can separate with your fingers.

To make almond flour, take raw almond slivers (skinless almonds), place in high output blender, food processor, or coffee grinder and grind until fine. Keep a close eye on it because if you blend too long it will turn into almond butter. You may have clumps that you can separate with your fingers.

Please note it is difficult to get the flour as fine as some of the manufacturers can, but with a high output blender it does a pretty good job.

- **Amaranth Flour:**

Take amaranth grain, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Black Bean Flour:**

Take black beans, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Brown Rice Flour:**

Take uncooked brown rice, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Buckwheat Flour:**

Take buckwheat groats, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Cashew Flour:**

Take raw cashews, place in high output blender, food processor, or coffee grinder and grind until fine. This should only take a few seconds. Keep a close eye on it because if you blend too long it will turn into cashew butter. You may have clumps that you can separate with your fingers.

- **Chestnut Flour:**

Take raw chestnuts, place in high output blender, food processor, or coffee grinder and grind until fine. Keep a close eye on it because if you blend too long it will turn into chestnut butter. You may have clumps that you can separate with your fingers.

- **Chia Seed Meal/Flour:**

Take chia seeds, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Coconut Flour:**

1. Take coconut flakes and soak for 4 hours in water at a ratio of 4:1 (Example: 4 cups water to 1 cup flakes).
2. After soaking place in a food processor or high output blender until smooth.
3. Over a bowl take all of the coconut mixture and place into a cheesecloth and squeeze as much of the liquid out as you can. Get all of the water out of it. This liquid is the coconut milk (it can be saved in the refrigerator to drink later or another use).
4. Spread the pulp out from the cheesecloth onto a baking sheet (you can use a fork to break up any large clumps).
5. Bake in a oven at lowest setting (150 degrees to 200 degrees) until dry, around four hours. Process in the food processor, high output blender, or coffee grinder until you have desired consistency, about 30 seconds.
6. Either use it at that time or place in air tight container and put in refrigerator for a later date.

- **Cornmeal/ Flour**

Take dried popcorn, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Fava Flour:**

Take dried fava beans, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Flaxseed Meal/Flour:**

Take whole flaxseed, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Garbanzo Bean Flour:**

Take dried garbanzo beans, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Green Pea Flour:**

Take dried green peas, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Hazelnut Flour:**

Take raw hazelnuts, place in high output blender, food processor, or coffee grinder and grind until fine. Keep a close eye on it because if you blend too long it will turn into hazelnut butter. You may have clumps that you can separate with your fingers.

- **Millet Flour:**

Take whole millet grain, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Oat Flour:**

Take groats, rolled or instant certified gluten-free oats, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Pumpkin Seed Meal/Flour:**

Take raw pumpkin seeds, place in high output blender, food processor, or coffee grinder and grind until fine. Grind for about 5 seconds at a time, and then check the consistency by touch, repeating the process until you reach the desired fineness.

- **Quinoa Flour:**

1. Rinse 2 cups of quinoa through a fine mesh sieve for at least 1 minute to remove any remaining saponins.
2. Shake off as much water as possible, then spread on an ungreased large rimmed baking sheet. Bake at 350F for 12 to 15 minutes until dry, slightly golden and fragrant. Cool completely.
3. Place 1/4 cup of quinoa seeds in the grinder (adding any more will overload the grinder and prevent the seeds from being ground to a fine consistency).
4. Using on/off pulses, process, shaking the grinder every few pulses to ensure an even grind, until the seeds are finely and evenly ground.
5. Repeat with more seeds until you have the desired amount of flour.

Note:

- 1/4 cup whole quinoa seeds yields about 1/3 cup of fine quinoa flour. Store quinoa flour in an airtight container of the refrigerator for up to 6 months, or freeze for up to 1 year.
- Toasting the quinoa gets rid of any remaining bitterness and lends a deepened nutty flavor that is wonderful in baked goods.
- Pulse for about 10-15 seconds at a time, shaking the grinder up and down as you go. The shaking is key: it ensures that the flour will be very fine and evenly ground. Keep it up until the flour is very fine to the touch, about 1-1/2 minutes total. And there you have it! Ultra-fine quinoa flour in just over 1 minute

Source for making your own: <http://powerhungry.com/2012/05/quinoa-flour-101-make-your-own-quinoa-flour/>

- **Sweet Rice Flour:**

Take uncooked sweet "sticky" rice, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Sunflower Seed Meal/Flour**

Take shelled, raw sunflower seed, place in high output blender, food processor, or coffee grinder and grind until fine. Grind for about 5 seconds at a time, and then check the consistency by touch, repeating the process until you reach the desired fineness.

- **Teff Flour:**

Take whole grain teff, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Walnut Flour:**

Take raw walnuts, place in high output blender, food processor, or coffee grinder and grind until fine. Keep a close eye on it because if you blend too long it will turn into cashew butter. You may have clumps that you can separate with your fingers.

- **White Bean Flour:**

Take dried navy beans, place in high output blender, food processor, or coffee grinder and grind until fine.

- **White Rice Flour:**

Take uncooked white rice, place in high output blender, food processor, or coffee grinder and grind until fine.

- **Notes:**

Bean flours: Do not run it until the beans are finely ground. You do not want it to overheat! Run it for a minute, then let it rest and repeat.

Nut flours: Don't over grind nut flours, pulse for 5 to 10 seconds and then stop and check. If you over grind the nuts it will turn into nut butter.