



COOKING WITH BEANS, PEAS, LENTILS AND CHICKPEAS





Navy Other names: White Pea, Alubia Chica





Great Northern Other name: Large White



Black







Light Red Kidney

Dark Red Kidney





Split Desi Chickpea Other name: Chana dal



Garbanzo Other names: Kabuli, Bengal gram, Kabuli chana

Desi





# WHAT ARE PULSES?



Pulses are also known and often referred to as legumes. Pulse is the term for the edible seeds of legumes (plants with a pod), which includes:

Drv beans

- Dry peas
- Lentils
  Chicl
- Chickpeas (garbanzo beans)

Pulses do not include fresh green beans or peas. Although they are related to pulses because they are also edible seeds of podded plants, soybeans and peanuts differ because they have a much higher fat content, whereas pulses contain virtually no fat.



What are the health benefits of pulses?

Pulses are a nutritional power house! They are rich in protein, fibre and complex carbohydrates, low in fat and sodium and contain a variety of vitamins and minerals. These nutrients make pulses an important part of any healthy diet, including the gluten-free diet.

- Pulses are a **good source of plant protein**. Eating pulses with gluten-free grains, nuts or seeds ensures a high quality, complete protein.
- Pulses are very high in fibre. They contain both soluble and insoluble fibre. Soluble fibre helps lower cholesterol and other blood lipid levels, while insoluble fibre helps with digestion and maintaining regular bowel movements. High-fibre diets may also reduce the risk of certain cancers. Fibre-rich foods like pulses are often more filling than other foods, helping you keep full until your next meal, an added bonus for those watching their weight.



In order to avoid digestive issues when adding highfibre foods like pulses to your diet, gradually increase your intake and make sure you drink enough water!

- Pulses have a low glycemic index. Most of the carbohydrates in pulses are fibre and resistant or slowly digested starch that prevent blood sugars from rising quickly after a meal or snack. Eating foods with a low glycemic index can help you to control your blood glucose levels, maintain high energy levels throughout the day, control your appetite and lower your risk of developing type 2 diabetes.
- Pulses are **low in fat and sodium** making them a heart healthy option. Pulses are also free of trans fats and cholesterol.
- Pulses are an excellent source of folate, a B vitamin, which has been shown to lower homocysteine levels. Evidence suggests that high levels of homocysteine (a type of protein) damages the lining of arteries and promotes plaque buildup and blood clots. Over time, this damage can slow or block blood flow to the heart or brain causing a heart attack or stroke. Folate

also plays a role in cell development. This is especially important during infancy and pregnancy when new cells are rapidly being formed.

- Pulses are a good source of other B vitamins such as thiamin (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5) and pyridoxine (B6). B vitamins are essential for healthy cells and help our bodies create energy from foods.
- Pulses are **high in potassium**, a mineral which helps regulate fluid balance and maintain normal blood pressure.
- Pulses are a **good source of various minerals** such as iron, zinc, magnesium and calcium that play important roles in the body.

For more information about the nutrient composition of pulses see Tables A & B on pages 9-10.

Make sure to drink enough water when adding high fibre foods like pulses to your diet!

# CELIAC DISEASE AND THE GLUTEN CONNECTION

Celiac disease is an inherited autoimmune disorder that affects 1:100 people. This digestive disease is triggered by the consumption of gluten - a protein found in wheat, rye and barley grains. When an individual with celiac disease ingests gluten, the lining of the small intestinal tract is damaged and important nutrients such as iron, calcium, vitamin D and folate cannot be absorbed. Gluten not only affects the gastrointestinal system but many other organ systems in the body. This can cause a wide range of symptoms that vary from one person to another. Some people can have numerous symptoms while others may only have a few symptoms.

Symptoms of celiac disease can include nausea, bloating, gas, abdominal pain, diarrhea or constipation (or both), lactose intolerance, weight loss, mouth ulcers, extreme fatigue, irritability, bone and joint pain, easy bruising of the skin, swelling of the ankles and hands, menstrual irregularities, elevated liver enzymes, migraine headaches, depression, ataxia (balance and coordination difficulties), neuropathy and a skin condition called dermatitis herpetiformis. Children may also have delayed growth, dental enamel defects and concentration and learning difficulties.

Untreated celiac disease can lead to nutritional deficiencies including anemia and osteoporosis, infertility (in both women and men), miscarriage, development of other autoimmune disorders and intestinal cancer.

The only treatment for celiac disease is a strict gluten-free diet for life. All forms of wheat, barley and rye must be eliminated. This includes kamut, spelt, einkorn, emmer, faro, durum, triticale, semolina, bulgur and couscous, barley malt, barley malt extract, barley malt flavour, malt vinegar, as well as barley-based beer, ale and lager.

Gluten is found in a wide variety of foods such as breads and other baked goods, cereals, pastas, soups, prepared meats (e.g. luncheon meats, hot dogs, burgers, imitation seafood), sauces, salad dressings, seasonings, snack foods, flavoured coffees and herbal teas, candies (e.g., licorice, chocolates, chocolate bars), as well as some supplements and medications.

Gluten sensitivity

Some individuals may be sensitive to gluten but do not have celiac disease. This is referred to as gluten sensitivity or non-celiac glutensensitivity (GS). Unlike celiac disease, GS is not an autoimmune disorder nor does it cause damage to the small intestine. However, symptoms are highly variable and may often be similar to celiac disease making diagnosis a challenge. The treatment for GS is also a glutenfree diet. Further research about GS is needed in order to better understand the condition and its management.

The gluten-free diet

Many foods are naturally glutenfree including plain meat, poultry, fish, eggs, nuts, seeds, pulses, milk, yogurt, cheese, vegetables and fruits. A variety of gluten-free grains, flours and starches can be substituted for wheat, rye and barley. A growing number of gluten-free ready-to-eat baked products, baking mixes and flours, hot and cold cereals, crackers, snack foods, entrées, soups, pastas, sauces and snack bars can be found in health food and grocery stores, as well as from online retailers.

## GLUTEN-FREE GRAINS, FLOURS AND STARCHES

- Amaranth
- Arrowroot
- Buckwheat
- Corn
- Flax
- Indian rice grass (Montina<sup>™</sup>)
- Mesquite flour
- Millet
- Nut flours (almond, hazelnut, pecan)
- Potato flour
- Potato starch

### GLUTEN-FREE GRAINS, FLOURS AND STARCHES (CONT'D)

- Pulse flours (bean, chickpea/ garbanzo, lentil, pea)
- Quinoa
- Rice (black, brown, sweet, red, white & wild)
- Rice bran
- Rice polish
- Sorghum
- Soy
- Sweet potato flour
- Tapioca (cassava/manioc)
- Teff

Nutrition and the gluten-free diet

Many gluten-free products are made with refined flours and starches such as white rice flour, tapioca flour, potato starch and cornstarch. These are low in fibre, protein, iron, B vitamins and other nutrients. Also, these products are not usually enriched with vitamins and minerals like gluten-containing baked items, cereals, pastas and flours. Gluten-free products are also often higher in sugar, fat and calories. Adding pulses can boost the nutritional quality of gluten-free foods. Pulses are rich in fibre, protein, vitamins and minerals, and are low in fat - the perfect addition to the gluten-free diet! See how pulses and pulse flours compare to rice and other common gluten-free flours and starches in tables below.

If you eat rice regularly try mixing half with pulses. This will provide a complete protein as well as boost the fibre, mineral and vitamin content of your diet.

Nutrients	Units	Black Beans	Navy Beams	Chickpea/ Garbanzo Bear	Whole Lentils	Dehulled Split Yellow Peas	White Rice (Enriched)	Brown Rice
Protein	g	15.2	15.0	14.5	17.9	16.4	4.6	5.0
Fibre	g	15.0	19.1	12.5	16.0	16.3	1.4	3.5
Carbohydrate	g	41	47	45	40	41	41	45
Iron	mg	3.6	4.3	4.7	6.6	2.5	2.9	0.8
Calcium	mg	46	126	80	38	27	30	20
Zinc	mg	1.9	1.9	2.5	2.5	2.0	0.6	1.2
Thiamin (B1)	mg	0.42	0.43	0.19	0.34	0.37	0.34	0.19
Riboflavin (B2)	mg	0.10	0.12	0.10	0.15	0.11	0.03	0.05
Niacin (B3)	mg	0.9	1.2	0.9	2.1	1.7	3.6	3.0
Pyridoxine (B6)	mg	0.12	0.25	0.23	0.35	0.10	0.25	0.28
Folate	mcg	256	255	282	358	127	128	8

### TABLE A - NUTRITIONAL COMPOSITION OF PULSES AND WHITE AND BROWN RICE (PER 1 CUP/250 ml COOKED)

Dehulled: the outer layer (hull) is removed

TABLE B - COMPARISON OF FOLSE FLOORS AND COMIMONET USED GLOTEN FREE FLOORS AND STARCHES (FER T COF/250 IIII)										
Nutrients & Units			Pulse Flours				Gluten-Free Flours & Starches			
Nutrients	Units	Black Bean	Nayy Bean	Chickpea	Yellow Peg	White Rice Flour	Brown Rice Flore	Corn Starch	Potato Starch	lapioca starch
Protein	g	30.9	30.2	25.7	24.7	9.4	11.4	0.3	0.2	0
Fibre	g	28.0	26.9	17.3	20.6	3.8	7.3	1.2	0	0
Carbohydrate	g	91	81	73	71	127	121	117	158	119
Iron	mg	11.8	9.3	6.8	5.4	0.6	3.1	0.6	2.9	0
Calcium	mg	189	347	92	90	16	17	3	19	0
Zinc	mg	4.7	4.0	3.5	3.9	1.3	3.9	0.1	n/a	0
Thiamin (B1)	mg	0.88	0.77	0.70	0.73	0.22	0.70	0	0	0
Riboflavin (B2)	mg	0.21	0.15	0.16	0.15	0.03	0.13	0	0	0
Niacin (B3)	mg	3.8	3.5	1.8	3.0	4.1	10.0	0	0	0
Pyridoxine (B6)	mg	0.56	0.41	0.54	0.12	0.69	1.2	0	n/a	0
Folate	mcg	343	303	334	15	6	25	0	n/a	0

TABLE B - COMPARISON OF PULSE FLOURS AND COMMONLY USED GLUTEN FREE FLOURS AND STARCHES (PER 1 CUP/250 ml)

Note: n/a = not available

# PULSES FOR A HEALTHY PLANET

When you're eating products made from pulses, you're making a choice that is good for the environment. Pulses take less energy to grow than other crops, producing fewer greenhouse gases. Pulse crops are also one of the most environmentally-friendly sources of protein, contributing to sustainable food production by protecting and improving soil and water resources.

# USING PULSES IN THE GLUTEN-FREE DIET

Pulses are versatile, delicious and an economical gluten-free option. Cooked lentils, peas, beans and chickpeas, as well as pulse flours can be incorporated into the diet in a variety of ways.

# Easy ways to eat more pulses

- 1 Include 1/3 cup (75 ml) of cooked black, white or cranberry beans in an omelette to add protein and fibre.
- 2 Add 1 cup (250 ml) of cooked whole or puréed chickpeas or lentils to your spaghetti sauce or chili and reduce the amount of ground beef used. This lowers the fat while adding fibre.
- 3 Mix ½ cup (125 ml) of black beans into 1 cup (250 ml) of gluten-free salsa. Add some chopped cilantro and a squeeze of lime juice for an easy party dip. Serve with raw vegetables or gluten-free crackers.
- 4 Drain and purée 1 cup (250 ml) of canned lentils with your favourite herb and spread on toasted gluten-free bread, bagel or English muffin.
- 5 Add ½ cup (125 ml) of cooked lentils, chickpeas or beans to soups. This works best for broth style soups.

- 6 When making gluten-free pizza, add a handful of black beans to your usual toppings.
- 7 Toss 1 cup (250 ml) of canned chickpeas or black beans with any salad for a different twist.
- 8 Serve hummus with carrots, celery or other vegetables or spread the hummus on gluten-free crackers or rice cakes.
- **9** Mix beans or lentils with wild or brown rice and herbs and serve as a side dish or main meal.
- 10 Add puréed lentils, black or white beans to baked recipes. See Pages 19, 23, 27 & 28 for recipes.
- **11** Mix ½ (125 ml) to 1 cup (250 ml) cooked and mashed white beans into chicken salad, tuna salad or egg salad for sandwiches.
- 12 Replace half the amount of oil in a muffin recipe with the same amount of puréed lentils to lower the fat while boosting the fibre and protein content.

How many pulses should I eat?

Canada's Food Guide recommends eating beans and lentils often as an alternative to meat products. One serving of pulses equals <sup>3</sup>/<sub>4</sub> cup (175 ml) or about the size of a tennis ball.

The United States Department of Agriculture MyPyramid food guidance system includes pulses in both the Meat & Beans group as well as the Vegetable group. One-half cup of pulses counts as a two ounce equivalent in the Meat & Beans group or one serving in the Vegetable group. According to the USDA, consuming dry beans and peas is recommended for everyone because of their high nutrient content.

### http://www.mypyramid.gov/pyramid/dry\_beans\_peas\_table.html

Pulses can be eaten every day. If you do not eat pulses often, start by adding them to your diet gradually, as incorporating high fibre foods into the diet slowly will help to control bloating and gas if you are not used to them. Remember to drink plenty of fluids, especially water, when increasing fibre intake to help aid digestion.

# USING PULSES IN GLUTEN-FREE BAKED RECIPES



## BENEFITS OF BAKING WITH PULSES:

- Using pulses instead of commonly used gluten-free flours and starches can boost the protein, fibre and vitamin and mineral content of foods.
- The high protein content of pulses improves the texture of baked goods.
- The high fibre content and moisture from pulses extends the shelf life of baked goods.
- Baked goods may be heavier and more dense when made with pulses, while crusts are smoother and remain fresher for a longer time.

Gluten-free baking tips

- To measure flour, whisk it in the canister a few times to aerate it and then lightly spoon it into a measuring cup before leveling it off with a knife. Don't use the measuring cup as a scoop; you'll get up to 20% more flour in the recipe which can result in dry baked items. Don't pack the flour down and don't measure dry ingredients like flour or sugar in spouted glass measuring cups (meant for liquids) because you may get more than necessary.
- To avoid cross-contamination with other glutencontaining grains and flours, buy gluten-free flours and pulses in sealed packages rather than in bulk bins. We used flours from Best Cooking Pulses and Bob's Red Mill to develop the recipes in this booklet.
- To replace unsalted butter with dairy-free margarine or buttery spread – both contain salt – you may need to reduce the salt in the recipe by 25%. Be sure to read

the labels to make sure these dairy substitutes are appropriate for your diet. In the United States, Earth Balance buttery spreads are gluten-free, dairy-free and available in soy and soy-free versions. In Canada, Becel Vegan is gluten-free and lactose-free. Although lowcalorie margarines or buttery spreads may be used in cooking, they are not appropriate for baking because their higher water content can upset the balance between liquid and dry ingredients.

- Baking recipes work best with cow's milk or milk substitutes made from coconut, hemp, nuts, rice, or soy. Fat-free or unsweetened versions of these dairy substitutes are not recommended because they lack enough oil and sugar necessary for pleasant taste and texture.
- The high moisture content of pulse purées may require longer baking times.
- Pulse flours absorb more moisture than other flours. More liquid or eggs may be necessary in baking.



Using xanthan gum

Gluten-free baked goods require xanthan gum or guar gum to prevent crumbling. These gums perform the function of gluten and are essential for success, so don't omit them.

USING XANTHAN GUM				
WHERE?	HOW MUCH?			
Cookies	<sup>1</sup> / <sub>4</sub> tsp (1 ml) per cup (250 ml) of flour			
Cakes	1/2 tsp (2 ml) per cup (250 ml) of flour			
Muffins, Quick Breads	<sup>3</sup> ⁄ <sub>4</sub> tsp (4 ml) per cup (250 ml) of flour			
Bread	1 to 1½ tsp (5 ml - 7 ml) per cup (250 ml) of flour			
Pizza	2 tsp (10 ml) per cup (250 ml) of flour			

Be sure to follow the recommended times for mixing, blending or beating. Since gluten-free baked items have no gluten, there is no worry of over-working the gluten. The extra time needed to work the batter will help the xanthan gum complete its task as a thickener and binder.

### GLUTEN-FREE BAKING TIPS (CONT'D)

- When measuring flours, be sure to fluff the flour with a whisk or fork and then spoon it into the measuring cup. Doing so will lighten the flour and avoid having a dense dry baked good.
- Don't leave gluten-free baked items in the pan to cool for too long. They will get a soggy bottom. Lift them out of the pan and let them finish cooling on a cooling rack.
- Xanthan gum is a very common ingredient in gluten-free baking. Make sure to follow amounts listed exactly, as using too much could lead to chewier, denser products, while using too little could result in a crumbly product.
- Many gluten-free baked good recipes call for more than one type of flour. The reason for this is because different gluten-free flours have different ratios

of proteins and starches, not to mention flavours. Combining flours helps produce optimal end products in texture and taste.

- When baking gluten-free breads and rolls, it is important to use pans with sides or walls. This helps to keep the 'normal' shape of breads or rolls made without gluten. Gluten normally helps form and keep the classic round shapes of bread loaves and buns. Without the walls on the pan, the gluten-free bread or rolls you are attempting to make will most likely fall flat. Nonstick (gray, not black) metal pans are best for breads, muffins, cakes and cupcakes.
- Gluten-free baked goods are best eaten fresh! They tend to get dry and dense if left out for too long.
- Some recipes call for the batter to sit for 10-20 minutes. The reason for doing this is to give the baking powder/ soda a chance to rise.



Pulse purée recipe

Pulse purée can be made from canned or boiled pulses. Here are two methods:

## STARTING WITH CANNED PULSES (LENTILS OR BEANS ARE BEST)

- 1 Rinse and drain a 15-ounce can of pulses; discard the liquid; yields about 1 ¼ cups (300 ml) pulses.
- 2 Place the pulses in a food processor, add ¼ cup (50 ml) hot water and purée (scraping down sides of bowl frequently) until the mixture has the consistency of canned pumpkin, about 3 minutes. If needed, add additional water, 15 ml (1 tablespoon) at a time, to reach this consistency.
- 3 Makes about 1 cup (250 ml) purée. Refrigerate or freeze unused purée (see tips for storing cooked pulses).

## STARTING WITH RAW PULSES

- Add ¼ cup (75 ml) sorted and rinsed raw lentils or beans to 2 cups boiling water. Cook according to Table D until soft. Drain; discard the cooking water, leaving you with about 1 ¼ cups (300 ml) cooked pulses.
- 2 Place lentils in a food processor, add ¼ cup (50 ml) hot water and purée (scraping down sides of bowl frequently) until the mixture has the consistency of canned pumpkin, about 3 minutes. If needed, add additional water, 15 ml (1 tablespoon) at a time, to reach this consistency.
- 3 Makes about 1 cup (250 ml) purée. Refrigerate or freeze unused purée.

Check out tasty recipes using pulse purées on pages 19, 23, 27, 28 & 29.



Brown rice flour blend\*

1½ cups (375 ml) brown rice flour 1½ cups (375 ml) potato starch 1 cup (250 ml) tapioca flour (also called tapioca starch)

Blend thoroughly. Store, tightly closed, in dark, dry place.

\*Recipes using this flour blend are found on pages 21, 23, 24, 25, 27 & 28.