

PULSES



Baking with Pulse Flours for Flavor and Functionality



- ✓ FIBER ENRICHMENT
- ✓ PROTEIN ENRICHMENT
- ✓ FOLATE ENRICHMENT
- ✓ HIGH LYSINE
- ✓ LOW FAT
- ✓ GLUTEN FREE
- ✓ CHOLESTEROL FREE
- ✓ LOW ALLERGEN
- ✓ LOW GLYCEMIC INDEX



ANCIENT CROP, MODERN FUNCTIONALITY

Dry peas, beans, lentils and chickpeas—collectively known as pulses—are among the world's oldest crops, having been cultivated for thousands of years. They have an ancient history—but today, pulses are more popular than ever. Pulse derivatives—including flour, protein, fiber and starch—are functional ingredients that enhance the nutritional profile of many foods, including baked goods.

Reaping the Nutritional Benefits of Pulses

When you examine the nutritional and performance attributes of pulses, it's easy to see the value they bring to the table.

- ✓ Dry peas, beans, lentils and chickpeas have a **low glycemic index**, and serve as **rich sources of protein, complex carbohydrates, vitamins and minerals**.
- ✓ They are **low in fat** and, as vegetable proteins, **contain no cholesterol**.
- ✓ Pulses and pulse derivatives can be used in food items to help customers achieve a more complete, healthy diet. **They contain more dietary fiber than any other food group** and enrich the fiber content of baked goods without altering an item's appearance, taste or texture.
- ✓ **They're a natural source of folate and zinc**, eliminating the need for the folate enrichment required for many baked products in the US, including breads.



NUTRITIONAL ANALYSIS OF PULSE AND COMMON FLOURS, PER 100 GRAMS

Excellent source of

	FLOUR	CALORIES	GLUTEN-FREE	FAT	PROTEIN	FIBER	POTASSIUM	FOLATE	IRON
PULSE FLOURS	DRY PEA	341	✓	1.2g	24.6g	25.5g	981mg	274mcg	4.4mg
	LENTIL	343	✓	1.1g	25.8g	30.5g	955mg	479mcg	7.5mg
	CHICKPEA	387	✓	6.7g	22.4g	10.8g	846mg	437mcg	4.9mg
	PINTO BEAN	360	✓	2.4g	21g	21g	1000mg	120 mcg	5.3mg

	FLOUR	CALORIES	GLUTEN-FREE	FAT	PROTEIN	FIBER	POTASSIUM	FOLATE	IRON
COMMON FLOURS	POTATO	357	✓	0.3g	6.9g	5.9g	1001mg	25mcg	1.4mg
	RICE (brown)	363	✓	2.8g	7.2g	4.6g	289mg	16mcg	1.9mg
	CORN (whole grain, white)	361	✓	3.9g	6.9g	7.3g	315mg	25mcg	2.4mg
	ALL-PURPOSE	364		1.0g	10.3g	2.7g	107mg	26mcg	1.2mg
	WHOLE WHEAT	340		2.5g	13.2g	10.7g	363mg	44mcg	3.6mg

Healthier Baked Goods

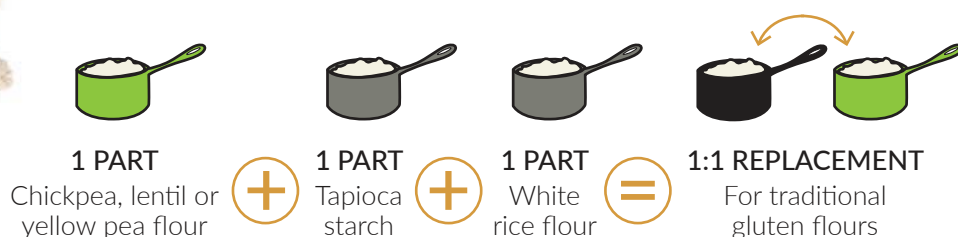
Pulse products help food manufacturers and operators create healthier versions of baked goods that still have traditional appeal. With snacking on the rise, consumers are eating desserts and mini-meals throughout the day. Offering a healthier alternative to traditional baked goods serves to satisfy this demand.

	PULSE FLOUR	PULSE FIBER	PULSE PROTEIN	PULSE STARCH
ATTRIBUTES	<ul style="list-style-type: none"> Fiber and protein enrichment Neutral color Excellent flavor carrier, improving flavor attributes in baked goods Mild, toasty flavor when roasted Folate, zinc enrichment 	<ul style="list-style-type: none"> Economical, nutritious gum alternative to enhance dough yield Modify texture Create full-bodied mouthfeel Improve uniformity and consistency Reduce breakage in bars/cookies Enrich white bakery products without affecting color or flavor 	<ul style="list-style-type: none"> High-lysine Low allergen Economical alternative to soy Soluble, excellent water holding capacity Enhanced nutrition, protein fortification Give structure to gluten-free products 	<ul style="list-style-type: none"> Improve crispiness, volume, appearance Excellent gel strength Neutral flavor
BAKING APPLICATIONS	<ul style="list-style-type: none"> Breads, breakfast bars Flatbreads, pitas, rolls, doughnuts, buns, crackers Gluten-free bakery products, cookies 	<ul style="list-style-type: none"> Nutrition bars White breads, bagels, muffins, cookies, cakes, tortillas 	<ul style="list-style-type: none"> Nutrition bars Tortillas Breads 	<ul style="list-style-type: none"> Cookies, crackers Breakfast bars, snacks



Gluten-Free Flour Blends

To replace traditional gluten flours in baking applications, use the following pulse flour blend:



Challenges and Considerations

FLAVOR

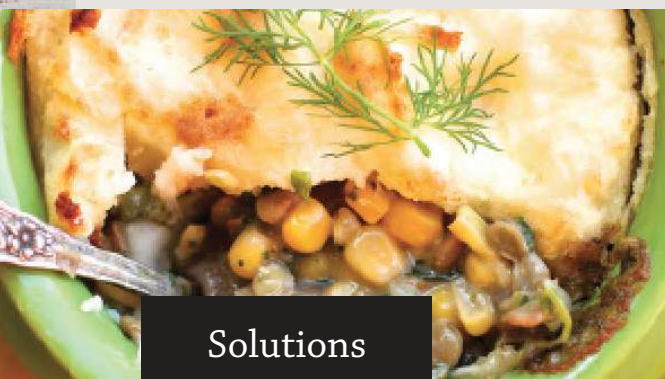
Pulses have distinct flavor profiles, some of which are better suited to baking than others. The flavor of chickpea flour can be strong, so do not use it in recipes with more delicate flavors such as sugar cookies or biscotti. Pea flour, on the other hand, does not impart additional flavor to baked goods.

TEXTURE

Gluten forms when common flours and water are mixed, giving elasticity to dough. Special treatment must be given to gluten-free pulse flours to ensure workability of dough and batters that will rise and hold their shape.

COLOR

Some pulse flours may impart color to baked goods that traditionally call for white flour; for example, green pea flour adds a green hue.



Solutions



The Keys to Success

As you incorporate pulse flours into baked goods, it's critical to consider their functional properties in order to achieve a successful balance of flavor, texture and color in the end product.

XANTHAN GUM

Gums provide the "stretch factor" of gluten, helping flours bind when used in gluten-free baked goods. Simply combine with flour before adding liquid to a dough or batter. Guar gum is another thickening agent that can be used.

PRECOOKING PULSE FLOUR

Precooking pulse flour partially gelatinizes the starch, denatures protein and inactivates enzymes, resulting in a product with increased shelf life that is microbially safe and more stable than wheat flour.



For more information, contact: **USA Dry Pea and Lentil Council/ American Pulse Association**
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