About Wheat Flour

Definition

Flour is the product obtained by grinding wheat kernels or "berries". The kernel consists of three distinct parts: **Bran**, the outer covering of the grain; **Germ**, the embryo contained inside the kernel; and the **Endosperm**, the part of the kernel that makes white flour. During roller milling the three parts are separated and recombined accordingly to achieve different types of flour.

There are six different classes of wheat: hard red winter, hard red spring, soft red winter, hard white, soft white and durum. The end products are determined by the wheats characteristics, especially protein in the flour. Soft, low protein wheats are used in cakes, pastries, cookies, crackers and Asian noodles. Hard, high protein wheats are used in breads and quick breads. Durum is used in pasta and egg noodles.

Storage

Flour should be stored in airtight containers in a cool, dry place (less than 60% humidity). All-purpose, bread and cake flour will keep for six months to a year at 70F and two years at 40F. Store away from foods with strong odors. Most whole grain flours and meals will keep for 1 to 3 months on a cool, dry pantry shelf or 2 to 6 months in the freezer. Whole wheat berries will keep for up to 6 months on a cool, fry pantry shelf or up to year in the freezer. Check for rancidity and taste before using.

Nutritional Value

Wheat flour is an excellent source of complex carbohydrates. All types of wheat flour, except high gluten flour get at least 80% of their calories from carbohydrates. Depending on the flour type, the percent of calories from protein ranges from 9-15%, except from gluten, which has a 45% protein content. Calories from fat are usually never more than 5%.
In addition, wheat flour provides from 3g (cake flour) to 15g (whole wheat flour) of dietary fiber per 100g or ~1 cup serving. Wheat flour contains B vitamins, calcium, folate, iron, magnesium, phosphorus, potassium, zinc and other trace elements.

Types of Flour

White flour	finely ground endosperm of the wheat kernel.
All-purpose flour	white flour milled from hard wheats or a blend of hard and soft wheats. It gives the best results for many kinds of products, including some yeast breads, quick breads, cakes, cookies, pastries and noodles. All-purpose flour is usually enriched and may be bleached or unbleached. Bleaching will not affect nutrient value. Different brands will vary in performance. Protein varies from 8% to 11%.
Bread flour	White flour that is a blend of hard, high-protein wheats and has greater gluten strength and protein content than all-purpose flour. Unbleached and in some cases conditioned with ascorbic acid, bread flour is milled primarily for commercial bakers, but is available at most grocery stores. Protein varies from 12% to 14%.
Cake flour	fine-textured, silky flour milled from soft wheats with low protein content. It is used to make cakes, cookies, crackers, quick breads and some types of pastry. Cake flour has a greater percentage of starch and less protein, which keeps cakes and pastries tender and delicate. Protein varies from 7% to 9%.
Self-rising flour	Also referred to as phosphated flour, is a convenience product made by adding salt and leavening to all-purpose flour. It is commonly used in biscuits and quick breads, but is not recommended for yeast breads. One cup of self-rising flour contains 1-1/2 teaspoons baking powder and 1/2 teaspoon salt. Self-rising can be substituted for all-purpose flour by reducing salt and baking powder according to these proportions.
Pastry flour	Has properties intermediate between those of all-purpose and cake flours. It is usually milled from soft wheat for pastry-making, but can be used for cookies, cakes, crackers and similar products. It differs from hard wheat flour in that it has a finer texture and lighter consistency. Protein varies from 8% to 9%.

Types of Flour

Semolina	The coarsely ground endosperm of durum, a hard spring wheat with a high-gluten content and golden color. It is hard, granular and resembles sugar. Semolina is usually enriched and is used to make couscous and pasta products such as spaghetti, vermicelli, macaroni and lasagna noodles. Except for some specialty products, breads are seldom made with semolina.
Durum flour	Finely ground semolina. It is usually enriched and used to make noodles.
Whole wheat, stone-ground, and graham flour	Can be used interchangeably; nutrient values differ minimally. Either grinding the whole wheat kernel or recombining the while flour, germ and bran that have been separated during milling produces them. Their only differences may be in coarseness and protein content. Insoluble fiber content is higher than in white flours.
Gluten flour	Usually milled from spring wheat and has a high protein (40-45%), low-starch content. It is used primarily for use with other non-wheat or low-protein wheat flours to produce a stronger dough structure. Gluten flour improves baking quality and produces high-protein gluten bread.

Wheat Flour Terms

The Food and Drug Administration (FDA) inspects and approves the use of flour treatments and additives that are used to improve the storage, appearance and baking performance of flour.

"Enriched" flour	Supplemented with iron and four B vitamins (thiamin, niacin, riboflavin and folic acid) and may be supplemented with calcium. There is no change in taste, color, texture, baking quality, or caloric value of flour.
"Presifted" flour	Sifted at the mill, making it unnecessary to sift before measuring.
"Bromated" flour	Largely discontinued in the United States. Ascorbic acid is now being added to strengthen the flour for bread doughs.
"Bleached" flour	Refers to flour that has been bleached chemically to whiten or improve the baking qualities. No change occurs in the nutritional value of the flour and no harmful chemical residues remain. It is a process which speeds up the natural lightening and maturing of flour.
"Unbleached" flour	Aged and bleached naturally by oxygen in the air. It is more golden in color and may not have the consistency in baking qualities that bleached flour does. Unbleached is preferred for yeast breads because bleaching affects gluten strength.
"Patent" flour	Bleached or unbleached, is the highest grade of flour. It is lower in ash and protein with good color. Market-wise, it is considered the highest in value.
"Organic" flour	USDA defines "organic" food as food grown and processed without using most conventional pesticides; without fertilizers made with synthetic ingredients or sewage sludge, without biotechnology; and without ionizing radiation.

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"Gluten"	A protein formed when water and wheat flour is mixed. Gluten gives bread dough elasticity, strength and gas retaining properties. Wheat is the only grain with sufficient gluten content to make raised or leavened loaf of bread. Other grains that contain gluten include rye and barley.

Wheat Resources

Oklahoma Wheat Commission
https://www.okwheat.org/

Wheat Foods Council
https://www.wheatfoods.org/wheat-101/

Oldways Whole Grains Council
https://wholegrainscouncil.org/whole-grains-101

USDA MyPlate - Grains
https://www.myplate.gov/eat-healthy/grains

OKLAHOMA COUNTY EXTENSION