

Selecting and Storing Cereals and Grains

WHEAT FLOUR

Definition: Flour is the product obtained by grinding then sifting 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 endosperm, the part of the kernel containing the flour. During milling, the three parts are separated and recombined accordingly to achieve different types of flours.

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 wheat's characteristics, especially protein and gluten content. The harder the wheat, the higher the amount of protein in the flour. Soft, low-protein wheats are used in cakes, pastries, cookies, crackers and noodles. Hard, high protein wheats are used in breads and quick breads. Durum is used in pasta and noodles.

Storage: Flour should be stored in airtight containers in a cool, dry place (less than 60 percent humidity). All-purpose, bread, cake and whole wheat flour will keep for six months at 90 °F, one year at 70 °F, and two years at 40 °F. Store away from foods with strong odors. Before using refrigerated or frozen flour, allow it to warm to room temperature and inspect for rancidity and taste.

Types of Flour:

- *White flour* is the finely ground endosperm of the wheat kernel.
- *All-purpose flour* is a 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 enriched and may be bleached or unbleached. Bleaching will not affect nutrient value.
- *Bread flour* is 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.

- *Cake flour* is fine-textured, silky flour milled from soft wheats with a 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.
- *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 1½ teaspoons of baking powder and ½ teaspoon of 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.
- *Semolina* is 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 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* is finely ground semolina. It is enriched and used to make noodles.
- *Whole wheat, stone-ground and graham flour* can be used interchangeably; nutrient values differ minimally. They are produced by either grinding the whole-wheat kernel or recombining the white flour, germ and bran that have been

separated during milling. Their only differences may be in coarseness and protein content. Insoluble fiber content is higher than in white flours.

- *Bran* is the outer layer of the wheat kernel that is removed to make white flour. It is sometimes ground into flour or it may come totally unprocessed as “miller’s bran.”
- *Gluten flour* is usually milled from spring wheat and has a high protein (41 percent), low starch content. It is used primarily for diabetic breads, or mixed with other nonwheat or low-protein wheat flours to produce a stronger dough structure. Gluten flour improves baking quality and produces high-protein gluten bread.
- *Wheat germ* is the heart of the wheat kernel. It comes flaked or in a coarse meal, either raw or toasted. Wheat germ adds a pleasant, nutty flavor to baked goods and increases their protein and mineral content. It is the most oil-rich and therefore the most perishable part of the wheat. At the supermarket, wheat germ is found in vacuum-packed jars that must be refrigerated after opening.

Wheat Flour Terms: The Food and Drug Administration inspects and approves the use of flour treatments and additives that are used to improve the storage, appearance and baking performance of flour. The treatments and additives are in no way harmful.

- *Enriched flour* is supplemented with iron and three B-vitamins (thiamin, niacin and riboflavin) and may also be supplemented with calcium. There is no change in taste, color, texture, baking quality or caloric value of flour.
- *Presifted* flour is sifted at the mill, making it unnecessary to sift before measuring.
- *Bromated* flour is largely discontinued in the United States. Ascorbic acid is now being added to strengthen the flour for bread doughs.
- *Bleached* 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 only a process that speeds up the natural lightening and maturing of flour.
- *Unbleached* flour is aged and bleached naturally by oxygen in the air. It is more golden in color, generally more expensive and does 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 highest in value.

- *Organic* or chemical-free flour is not standardized, so its definition varies from state to state. It may be grown and stored without the use of synthetic herbicides or insecticides. It may also mean no toxic fumigants were used to kill pests in the grain, and no preservatives were added to the flour, packaging or food product.
- *Gluten* is a protein formed when water and wheat flours are mixed. Gluten gives bread dough elasticity, strength and gas-retaining properties. Wheat is the only grain with sufficient gluten content to make a raised or leavened loaf of bread.

CORNMEAL

Cornmeal comes in two types, either ground from yellow corn or from white. They are virtually alike, except that yellow cornmeal contains more vitamin A. Cornmeal is an “enriched” product.

- *Water-ground* (stone-ground) cornmeal still contains the fat-rich germ of the corn kernel and has a fuller flavor than degerminated cornmeal. When buying, avoid packages with a rancid, stale odor.
- *Blue cornmeal*, from New Mexico, has a bluish-gray tint and a stronger, toastier flavor. It is often used for tortillas and tamales.
- *Corn grits* are also available in white or yellow. Grits are more coarsely ground than cornmeal.

OTHER FLOURS AND GRAIN PRODUCTS

- *Barley flour* makes a sweet, light-textured loaf of bread. It is usually combined with white flour because it does not have gluten of its own. Barley is sold also as pearl barley to be used mainly as a soup ingredient.
- *Buckwheat flour* is made from the seed of the fagopyrum, an herb. This flour is suitable for making pancakes. In Russia, it is called kasha. It is popular in Jewish cooking. In Japan and Korea, buckwheat noodles, called soba, are a staple.
- *Oatmeal* is made by rolling the groats (oats with hulls removed) to form flakes. *Oat bran* is the envelope of the groat, composed of the outermost pericarp. It is high in soluble fiber.
- *Potato flour* is sometimes called potato starch and is used in baking and as a thickener. It is made from cooked potatoes that have been dried and ground.
- *Quinoa* has a nutty flavor, and of all grains, it comes closest to having the “perfect” protein balance.
- *Rye flour* is the finely ground flour obtained by sifting rye meal. The dark and light varieties are interchangeable in recipes, but the dark does

have a stronger flavor. Rye and wheat flours are the only flours containing gluten-forming proteins that are important in baked goods.

- *Spelt* is a grain that is native to southern Europe and has a subtle, almost hazelnut flavor.
- *Soy flour* has a strong flavor and must be combined with wheat flour when used in baking. It is ground from whole soybeans and sometimes called soy powder or soya. Breads and cakes made with soy flour will be moist, fine-grained, and very high in iron, calcium and protein. It has none of its own starch or gluten, so it must always be combined with another flour.
- *Triticale* is a combination of wheat and rye and is used mostly in multigrain flours and in cereal mixes.
- *Amaranth* is a tall plant similar to corn, with a large shaggy head containing thousands of tiny seeds. The seeds are milled into whole grain flour, or puffed like rice or corn.

PASTA

Definition: “Pasta,” an Italian word meaning paste, describes the various shapes and sizes of products made with flour and water. Pasta products may be divided into two types, dried or commercial pasta and fresh or homemade pasta. They may also be categorized by their shapes:

Long goods: like spaghetti

Short goods: like macaroni

Specialty products: like shells and bow ties

Noodles: Ribbon-like shapes, generally made with eggs.

By law, egg noodle products must contain 5.5 percent egg solids by weight.

There are at least 350 shapes available in the United States and possibly 600 shapes worldwide. Pasta shapes can be used interchangeably in recipes. Pasta can be purchased plain or in a variety of colors and flavors such as tomato, spinach, herb and whole wheat, to name a few. Good-quality pasta is a golden color, with a fine, even grain. Pasta that is too white or too gray indicates poor quality flour that will not cook properly and will be limp and sticky. The water will be cloudy after cooking.

Buying American-made pasta ensures good quality as United States manufacturers adhere to the strictest ingredients and manufacturer’s inspections of any country in the world. By law, no artificial coloring can be added; enrichment laws are also followed, requiring that B-vitamins and iron be added to pasta as it is made.

Storage: Dry pasta can be stored almost indefinitely if kept in a tightly sealed package or a covered container in a cool, dry place.

If cooked pasta is not to be used immediately, drain and cover with cold water just to cool. Stir to aid the cooling. Do not allow the pasta to sit in water until cold, because it will continue to absorb water and become mushy. When the pasta is cool, drain and toss lightly with salad oil to prevent it from sticking and drying out. Cover tightly and refrigerate or freeze. Refrigerate the pasta and sauce separately or the pasta will become soggy. To reheat, put pasta in a colander and immerse in rapidly boiling water just long enough to heat through. Do not allow the pasta to continue to cook. Pasta may also be reheated in a microwave.

Preparation: Bring plenty of water (at least 4 quarts for every pound of dry pasta) to a rolling boil. Add about one tablespoon of salt per gallon of water, if desired. Add the pasta in small quantities to keep the rolling boil. Stir frequently to prevent sticking. Do not cover the pan. Follow package directions for cooking time. Do not overcook. Pasta should be “al dente” (meaning “to the tooth,” or tender, yet firm). It should be slightly resistant to the bite, but cooked through. Drain pasta to stop the cooking action. Do not rinse unless the recipe specifically says to do so. For salads, drain and rinse pasta with cold water.

RICE

Types of rice:

- *Long Grain rice* – long, slender kernel, four times longer than it is wide. Cooked grains are separate, light and fluffy.
- *Medium Grain rice* – kernel is two to three times longer than it is wide. Cooked grains are moist, tender and slightly clingy.
- *Short Grain rice* – kernel is almost round. Cooked grains cling together.
- *Aromatic rice* – brown or white rice with a natural aroma and flavor similar to that of roasted nuts or popcorn. The United States grows different kinds of aromatic rice. Some cook dry and separate and some cook moist and tender.
- *Sweet rice* – an opaque white grain. Cooked grains are very sticky.
- *Rough (Paddy) rice* – the kernels are still within the hull. Before rice can be prepackaged or cooked, the outer hull or husk must be removed.
- *Brown rice* – kernels of rice have had only the hull removed. Brown rice may be eaten as is or milled into regular-milled white rice. Cooked brown rice has a slightly chewy texture and a nut-like flavor. The light brown color of brown rice is caused by the presence of bran layers.
- *Parboiled rice* – rough rice that has gone through a steam-pressure process before milling.

Parboiled rice is favored by consumers and chefs who desire extra fluffy and separate cooked rice.

- *Precooked rice* – white or brown rice that has been completely cooked and dehydrated after milling. The process reduces the time required for cooking.
- *Rice flour* - ground from either white or brown rice. The white variety has almost no fat; the brown has a considerable amount. A variety of white rice flour called “sweet” rice flour can be used only as a thickener, so read the package label to be sure of what you are getting.

Preparation: For best results, always follow package directions. When no directions are available, use one of these methods for regular white rice.

- *Top-of-the-Range Instructions:* Combine 1 cup regular white rice, 2 cups liquid, 1 teaspoon salt (optional) and 1 teaspoon butter or margarine (optional) in 2- to 3-quart saucepan. Bring to a boil; stir once or twice. Reduce heat; cover and simmer for 15 to 20 minutes or until rice is tender. If rice is not quite tender or liquid is not absorbed, replace and cook 2 to 4 minutes longer. Fluff with fork.
- *Microwave Oven Instructions:* Combine 1 cup rice, 2 cups liquid, 1 teaspoon salt (optional) and 1 teaspoon butter or margarine (optional) in 2- to 3-quart deep microwave-proof baking dish. Cover and cook on HIGH for 5 minutes or until boiling. Reduce setting to MEDIUM (50 percent power) and cook 15 minutes. Fluff with fork.
- *Rice Cookers:* There are several reliable brands of rice cookers available. Care should be taken to follow individual manufacturer’s directions. In general, all ingredients are combined using ¼ to ½ cup less liquid than the top-of-the-range method.
- *Conventional Oven:* Cooking rice in a conventional oven with other foods is an efficient way of saving energy. Use boiling liquid. Combine ingredients in a baking dish or pan; stir. Cover tightly and bake at 350 °F for 25 to 30 minutes. Fluff with fork.
- *Reheating:* For each cup of cooked rice, add 2 tablespoons liquid. Cover and heat 4 to 5 minutes on top of range or in oven. In microwave oven, cook on HIGH about 1 to 1½ minutes per cup.

Storage: Uncooked rice can be stored on the shelf in a tightly sealed container. The shelf life of brown rice is shorter than that of white rice. The bran layers contain oil that can become rancid. Refrigerator storage is recommended for longer shelf life. Washing rice is not necessary; just measure and cook. Cooked rice can be refrigerated for up to seven days or stored in the freezer for six months.

CEREALS

Corn, wheat, rice, and oats are favorite grains for making cereals. All cereals keep best in airtight containers that keep out moisture, dust and insects. At home, a tightly sealed plastic bag is sufficient protection. Always look for a “use-by” date on the package. Crispness can be restored to ready-to-eat cereal by spreading it in a baking pan and putting it in a 350 °F oven for 5 minutes.

Instant hot cereals keep up to one year in their original box, but a tightly covered container is better. Since whole-grain cereals are rich in natural oils, purchase containers that do not have a rancid odor. Store whole-grain cereals in tightly covered containers or sealed plastic bags in the refrigerator where they should remain fresh for 5 months. When stored at room temperature, they will stay fresh one month.

Sources:

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