

2.4: Flour Streams and Types of Wheat Flour

Modern milling procedures produce many different **flour streams** (approximately 25) that vary in quality and chemical analysis. These are combined into four basic streams of edible flour, with four other streams going to feed.

- Top patent flour: This stream is composed of only the purest and most highly refined streams from the mill. It is low in ash and is approximately 50% of the flour extracted. The term ash indicates the mineral content (e.g., phosphorus) of the flour. When flour is burned, all that is left is the burned mineral elements that constitute ash.
- Second patent flour: This flour is composed of streams with an intermediate degree of refinement. It has an average ash content of approximately 0.45% and represents about 35% of the total flour. First clear flour: This stream contains the balance of the flour that possesses baking properties, and is high in ash and protein content. It is usually about 15% of the total flour.
- Second clear flour: This grade contains the poorest flour streams. It is very high in ash (approximately 0.75%), and has little or no baking quality. It is about 2% of the total flour.
- Feed streams: The balance of the streams from the mill are classed as feed. Feeds are marketed as bran, wheat shorts, flour middlings, and wheat germ.

Within the streams of edible flours, there are a number of different types of flour used in food preparation. Each has different characteristics, and with those come different uses, as described below.

All-Purpose Flour

General purpose or home use flours are usually a blend of hard spring wheats that are lower in protein (gluten) content than bread flours. They are top patent flours and contain sufficient protein to make good yeast breads, yet not too much for good quick breads, cakes, and cookies.

Note: A word about gluten quality as opposed to gluten quantity: The fact that a particular flour contains a high quantity of protein, say 13% to 15%, does not necessarily mean that it is of high quality. It may contain too much ash or too much damaged starch to warrant this classification. High quality is more important in many bread applications than high quantity. All-purpose flour is an example of a high-quality flour, with a protein content of about 12%.

Graham Flour

A U.S. patented flour, graham flour is a combination of whole wheat flour (slightly coarser), with added bran and other constituents of the wheat kernel.

Bread Flour

Bread flour is milled from blends of hard spring and hard winter wheats. They average about 13% protein and are slightly granular to the touch. This type of flour is sold chiefly to bakers because it makes excellent bread with bakery equipment, but has too much protein for home use. It is also called strong flour or hard flour and is second patent flour.

For example, the specification sheet on bread flour produced by a Canadian miller might include the following information:

- Ingredients: Wheat flour, amylase, ascorbic acid, niacin, iron, thiamine mononitrate, riboflavin, azodicarbonamide, folic acid.
- Moisture: 14.2%
- Ash: 0.54%
- Protein (5.7 x N) 13.00%

Along with this information there is microbiological data and an allergen declaration. (Note that the formula in parentheses beside "Protein" is simply the laboratory's way of deriving the protein figure from the nitrogen content.)

Cake Flour

Cake flour is milled from soft winter wheats. The protein content is about 7% and the granulation is so uniform and fine that the flour feels satiny. An exception is a high-protein cake flour formulated especially for fruited pound cakes (to prevent the fruit from sinking).

Clear Flour

Clear flour comes from the part of the wheat berry just under the outer covering. Comparing it to first patent flour is like comparing cream to skim milk. It is dark in colour and has a very high gluten content. It is used in rye and other breads requiring extra strength.

Gluten Flour

Gluten flour is made from wheat flour by removing a large part of the starch. It contains no more than 10% moisture and no more than 44% starch.

Pastry Flour

Pastry flour is made from either hard or soft wheat, but more often from soft. It is fairly low in protein and is finely milled, but not so fine as cake flour. It is unsuitable for yeast breads but ideal for cakes, pastries, cookies, and quick breads.

Self-Rising Flour

Self-rising flour has leavening and salt added to it in controlled amounts at the mill.

Wheat Germ Flour

Wheat germ flour consists entirely of the little germ or embryo part of the wheat separated from the rest of the kernel and flattened into flakes. This flour should be refrigerated.

Whole Wheat Flour

Whole wheat flour contains all the natural parts of the wheat kernel up to 95% of the total weight of the wheat. It contains more protein than all-purpose flour and produces heavier products because of the bran particles.

Whole Wheat Pastry Flour

Whole wheat pastry flour is milled from the entire kernel of soft wheat, is low in gluten, and is suitable for pastry, cakes, and cookies.

Hovis Flour

Most of the germ goes away with the shorts and only a small fraction of the total quantity can be recovered in a fairly pure form. At the mill, a special process developed in England to improve its keeping qualities and flavour cooks this fraction. It is then combined with white flour to make Hovis flour, which produces a loaf that, though small for its weight, has a rich, distinctive flavour.

Triticale Flour

The world's first new grain, triticale is a hybrid of wheat and rye. It combines the best qualities of both grains. It is now grown commercially in Manitoba.

Semolina

Semolina is the granular product consisting of small fragments of the endosperm of the durum wheat kernel. (The equivalent particles from other hard wheat are called farina.) The commonest form of semolina available commercially is the breakfast cereal Cream of Wheat.

No-Time Flour

The primary goal of all bakers has been to reduce production time and keep costs to a minimum without losing quality, flavour, or structure. After extensive research, millers have succeeded in eliminating bulk fermentation for both sponge and straight dough methods. No-time flour is flour with additives such as ascorbic acid, bromate, and cysteine. It saves the baker time and labour, and reduces floor space requirements. The baker can use his or her own formulas with only minor adjustments.

Blending Flours

Blending of flours is done at the mill, and such is the sophistication of the analysis and testing of flours (test baking, etc.) that when problems occur it is generally the fault of the baker and not the product. Today the millers and their chemists ensure that bakers receive the high grade of flour that they need to produce marketable products for a quality-conscious consumer. Due to the vagaries of the weather and its effect on growing conditions, the quality of the grain that comes into the mill is hardly ever constant. For example, if damp weather occurs at harvest time, the grain may start to sprout and will cause what is known as damaged starch. Through analysis and adjustments in grain handling and blending, the miller is able to furnish a fairly constant product.

Bakers do blend flours, however. A portion of soft flour may be blended with the bread flour to reduce the toughness of a Danish pastry or sweet dough, for example. Gluten flour is commonly used in multigrain bread to boost the aeration.

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