

# FLOUR

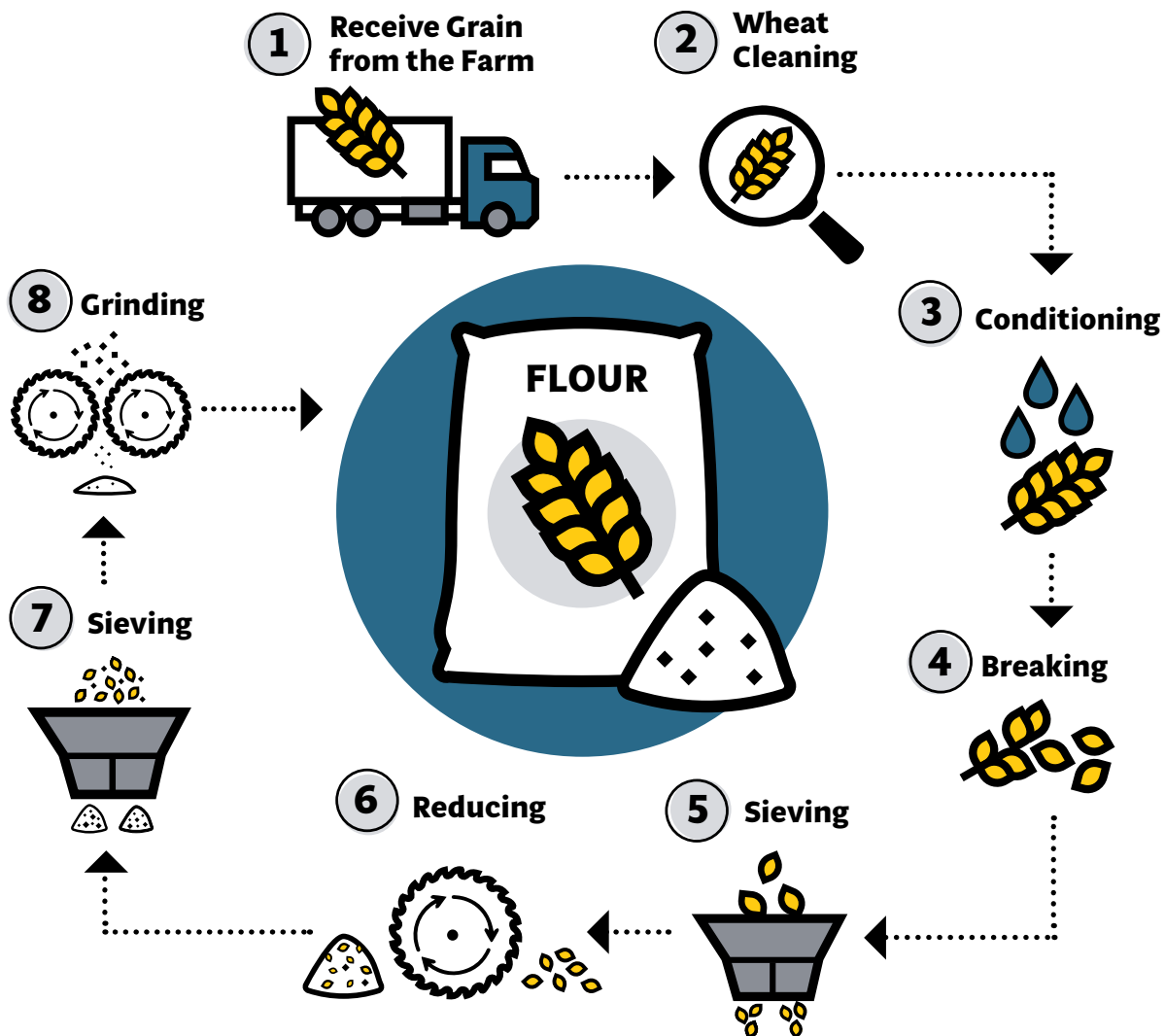
If you want to be great at making dough, you'll need to know a lot about the key ingredient, flour. First, we'll go through where it comes from and how it's made.

We know people have been crushing wheat seeds between stones since as early as 1600 B.C to make flour. As you can imagine, the technology has evolved over the years to improve the consistency and quality of the final product but in essence, flour is still made the same way by grinding seeds.

In North America wheat is classified as Spring wheat, sown in the spring and harvested in the fall and Winter wheat, sown in the fall and harvested in the summer. Winter Wheat typically has higher protein content, which is preferred to make pizzas, pasta and breads. Spring wheat typically has lower protein content, which is great for cakes and pastries.

## The Milling Process

To obtain flour, the wheat kernel is milled. The number of times the kernel goes through the sifting process at the mill determines the type of flour that will be produced. Sifting refers to how much of the outer part of the kernel is left in the flour. The more sifted the flour is, the less ash or bran will remain, creating a whiter flour. Using a flour with more bran (higher ash content) will result in a darker product. When used in baking, this creates a denser crumb because the bran is unable to create gluten.

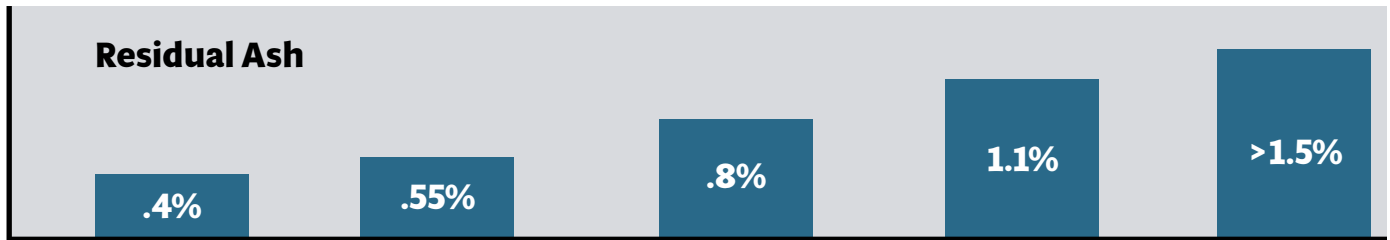


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Another parameter to define flours, other than “sifted grade,” is the Protein percentage or the “W” in Italian flours.

Sifted grade (or ash content) does not determine the protein content of the flour. A highly sifted flour can also be high in protein and vice versa.

As an example, a 00 flour can have 9% to >14% protein content with the least amount of bran. This is a simple table to understand how protein and ash content relate to each other.



US	pastry flour	all-purpose flour	bread flour or "high gluten flour"	1st clear flour	whole wheat
<b>French</b>	45	55	80	110	150
<b>Italian</b>	00	0	1	2	farina integrale

There are two proteins contained in the flour called glutenin and gliadin that when water is added combined with mechanical movement (like mixing) will create a bond called gluten. The reason why we use wheat flour to make dough is because of its capability, when mixed with the water, to create an elastic element that can hold the gasses produced during fermentation. Gluten is a natural protein found in some grains. People affected by celiac disease are allergic to this protein.

## Flours With Gluten

Wheat: wheatberries, durum, emmer, semolina, spelt, farro, graham, Kamut Khorasan, einkorn. Barley, rye and triticale and oats in some cases.

## Grains, Starches or Flour with No Gluten

Amaranth, arrowroot, buckwheat, corn, flax, rice, soy, hominy, millet, quinoa, sorghum, tapioca, teff.

Why is protein important? It's an indicator of how strong the gluten can be and how well it can hold carbon dioxide that is produced during fermentation. A higher protein flour can also absorb more water and/or liquids and hold a longer fermentation process.

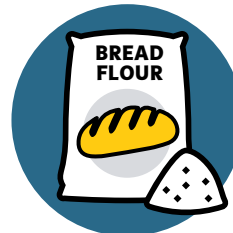
Below is a guide to compare protein percentage with the Italian W when using an Italian flour. Pizza dough is typically made with flour 10.5% - 15% protein and a W of 170 - 400.



**PROTEIN % = 9 - 10**  
**W = <160**



**PROTEIN % = 10 - 11 - 12**  
**W = 160 - 200 - 240**



**PROTEIN % = 12 - 13 - 14**  
**W = 260 - 300 - 380**



**PROTEIN % = > 14**  
**W = >380**

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Based on the protein percentage, the icons below are a guide to choosing the flour for the product you are going to make.

For cakes and pastries, use a lower protein content flour so that cakes and pastries will crumble. Medium and high protein flour is preferred to make breads and pizzas because they require higher hydration and higher extensibility. If you are interested in using a preferment, a higher protein flour is also a good choice.



**Pies, Tarts,  
Cookies**

**PROTEIN % = 9 - 10  
W = 90 - 130**

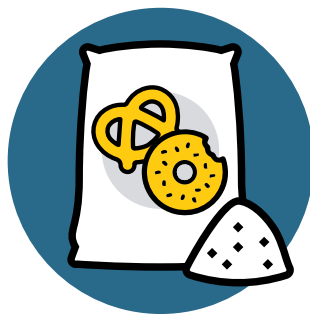


**Scones, Direct Doughs,  
Biscuits, Muffins,  
White Sliced Bread**

**PROTEIN % = 10 - 11  
W = 130 - 200**



**Breads, Pizza  
PROTEIN % = 10.5 - 11.5  
W = 170 - 200**



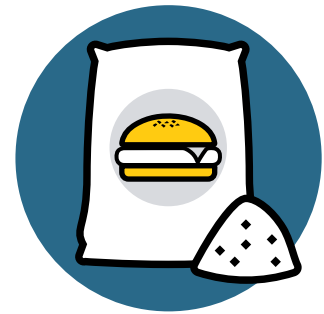
**Breads, Bagels,  
Pretzels, Pizza**

**PROTEIN % = 12 - 12.5  
W = 220 - 240**



**Breads, Pizza,  
Ciabatta Bread,  
Biga (Preferment)**

**PROTEIN % = 13  
W = 300 - 310**



**Long Fermentation  
Products, Panettone,  
Burger Buns**

**PROTEIN % = 13.5 - 15  
W = 340 - 400**

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## Other characteristics to know about the flour.

### **Bromated**

During the process of bromating the flour, potassium bromate is added to improve baked goods. This process improves elasticity and the rise of the dough, yielding a better crumb structure of the dough.

Potassium bromate is banned in many countries around the world. If the flour is bromated, it will be labeled on the flour bag.

### **Bleached**

Bleached flour uses bleaching agents to speed up the natural aging process of the flour that normally would take 10 days to several months, to only a few hours.

Bleached flours tend to be less nutritious, sometimes have a bitter taste and are banned in Australia, European Union and many other countries. The flour bag will indicate if the flour has been bleached.

### **Enriched**

Enriching flour is simply replacing nutrients that are lost during processing. The most common nutrients that are added to enrich the flour are: Thiamin, Riboflavin, Niacin, Folic acid and Iron, which are all common nutrients in flour before processing. The amount of any nutrient added to flour is defined by federal regulations.

### **Malted**

Malted flour is made from barley or wheat and rice that is malted. The barley is soaked in water, allowed to germinate then dried, hulled and grounded and sifted. The benefit of malted flour is that enzymatic activity is increased to help break down complex sugars and starch in the dough, making it easier for the yeast to feed on.

Malt is most used in dough making when baking at a relatively low temperature to help the dough turn the final product into a golden-brown color.

There are two kinds of malt diastatic and non-diastatic.

#### **Diastatic**

Usually used in malted flour. Diastatic malt is added to correct enzyme activity, is also used as a sweetener, imparts browning and increases gluten strength, improving volume and texture of the final product.

#### **Non-diastatic**

No active enzymes, has a sweet flavor, provides browning, glossy surface and soft crumb.

It is best to use a malted flour when baking goods such as pizza at medium temperature like NY, tavern and Chicago style pizzas. Malt is not recommended when baking at temperatures higher than 650°F, such as Neo-Neapolitan and Neapolitan pizza.

Blending different flours with different characteristics will help to create a unique product in terms of technical performance and flavor profile.