

5.5: Baking Powder

Baking powder is a dependable, high-quality chemical leavener. To be effective, all baking powders rely on the reaction between one or more acids on sodium bicarbonate to produce carbon dioxide gas. Just as with yeast leavening, the presence of carbon dioxide gas creates air bubbles that cause the product to rise.

There are two main types of baking powders available on the market:

- Continuous or single-action baking powder
- Double- or multiple-action baking powder

The difference between continuous- and double-action baking powders is simply the rate of reaction:

- Continuous-action baking powder uses one acid, which continuously reacts with the soda to release gas steadily throughout the baking process until all the gassing power is spent.
- Double-action baking powder contains two different acids, which react with soda at different stages of the baking process. One acid reacts to give off a small amount of gas at low temperature, and the other major acid reacts at baking temperatures to give off the bulk of the gas.

The Leavening Mechanism of Baking Powder

Before baking, approximately 15% of the CO₂ gas is released in the cold stage. Eighty-five percent of the CO₂ gas is released in the oven starting at approximately 40°C (105°F). Some leavening power is apparently lost in the cold stage, but there is usually still adequate gassing power in the remaining portion.

When the baking powder is activated through moisture and heat, the gas works its way into the many cells created by the mixing or creaming of the batter and starts to expand them. This process comes to a halt when the starch gelatinizes and the cells become rigid. This starts at about 60°C (140°F) and is more or less complete at around 75°C (167°F). After this point, some gas may still be created, but it simply escapes through the porous structure of the product.

Using Baking Powder

For even distribution throughout the batter, baking powder should be sifted with the flour or other dry ingredients. For most cakes, about 5% baking powder to the weight of the flour produces an optimum result. Accurate scaling is important, since a little too much may cause the product to collapse. (Note this is unlike yeast, where an “overdose” will usually simply cause a more rapid rise.)

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