



ROLE OF INGREDIENTS IN BREAD MAKING

Every ingredient used in the making of bread has a particular role to play in achieving the final, desired product. These ingredients however perform only when certain conditions are met and are highly dependent on each other to perform that particular function to the desired level.

1. FLOUR

Wheat flour dough has the unique ability to retain the gas produced during yeast fermentation or by chemical leavening. The flour is responsible for the characteristic structure of bakery foods. Wheat flour is the key ingredient in most breads. Flour quality is particularly important in bread making as the quality of the flour will have a significant impact on the finished product. When flour is moistened and stirred, beaten or kneaded, gluten develops to give dough 'stretch'. The elastic framework of gluten holds the gas produced by the fermentation action of yeast.

2. WATER

The main function of water is hydration. Ingredients must have water in order to function as expected. For example, flour must be hydrated in order to form gluten and for the starch to gelatinize. Water also serves as a dispersing agent and a medium for fermentation. There is a direct relationship between the amount of water present in a dough system and the rate of fermentation. The amount of water in flour is called hydration and is measured in percentage with regards to flour.

3. SALT

Salt brings out the flavor in baked goods. Salt is typically used at levels of 1.50-2.25%. Bread made with less salt will taste blander, and bread made with more than 2.25% salt will taste salty.

In addition to adding flavor, salt also inhibits fermentation due to the osmotic pressure effect, which is the partial dehydration of the yeast cell. Salt also toughens the gluten. Weak flours can be strengthened by adding salt. Salt lengthens mixing time, so it is common to delay the addition of the salt until the end of the mixing process. When the addition of salt is delayed, the toughening effect is also delayed, and mixing time can be reduced by 10-20%.

4. SUGAR

The main functions of sugar is to provide food for the yeast and give a sweet flavor to the finished product. In normal bread production, 3-3.5% fermentable solids are required for yeast activity. This food supply can come from added sugar, conversion of starches to sugars, or a combination of both.

Sugar is not an essential ingredient. Secondary functions of sugar are all related to non-fermented (residual) sugar. When residual sugar levels are higher, crust color is darker, taste is sweeter, and moisture retention is improved due to the hygroscopic properties of sugar.



Flour naturally contains about 2.5-3% of sugar in the form of sucrose and maltose. This is enough for the yeast in the initial stage of fermentation. However, in the final proof when maximum of the sugar is required to be broken down for an optimum rise, the natural sugars are exhausted and the addition of sucrose or maltose is required.

6. BREAD IMPROVER

It is blend of ingredients such as enzymes, emulsifiers and soya flour, that activates and strengthens the gluten and assists in improving the processes of dough kneading and fermentation. This results in a lighter loaf with better texture and keeping qualities. It also improves the crumb structure making the bread lighter and soft.

7. GLUTEN POWDER

It is almost pure gluten, blended in a powdered form. When added to the dough it improves its elasticity and also improves the crumb and chewiness of the final bread. It can be added to any recipe but is mostly preferred when baking with low protein flour or when its difficult to form the gluten, like in whole wheat flour.

8. OIL/FATS

Fats and oils are used in bread production to provide overall lubrication and to aid with slicing. A minimum of 0.7-1% is recommended for good slicing, although some bakers use less than this in low-calorie breads, and higher levels of 2-5% in richer bread products.

Besides lubricating the baked crumb, fats and oils also lubricate the dough, easing dough expansion and helping with the handling of the dough throughout the makeup processes. They also tenderize the crumb and improve shelf life by delaying staling.

7. MILK

Milk solids are used in bread formulas for many reasons, and they offer a wide range of functionality. Milk is high in lysine and calcium, and the overall nutritional quality of the milk protein is excellent.

Milk solids also impart a rich flavor to a finished product. They also create a deeper crust color which can contribute to an improved flavor profile. In addition to finished product benefits, milk solids provide function and benefit to dough processing. Milk is an excellent buffer, so milk solids can slow or regulate fermentation. They also strengthen the gluten matrix, which improves overall process tolerance.