

# American Society of Baking

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## FLOUR

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1. How long should flour be stored before using?
2. Is it best to blend two or more flours for bread making, and are there several different glutes in each blend?
3. How will fermentation be affected by such a blend?
4. What is the relation of Hydrogenion to fermentation period? Can you say a flour having a pH of 5.0 has a fermentation of a certain time, or is it only a comparative judgment as to flours we have already run?
5. What is meant by weak and strong flours?

In answering the questions asked during the First Annual Meeting of the American Society of Baking Engineers, and expressing ideas resulting from several years of direct contact with flour milling and baking, it is hoped that what is said here will not be interpreted by the reader as a means of trying to completely change the bake shop practice of any plant.

It is sincerely hoped that what is said here may by some means suggest to the reader a way of increasing the efficiency of his particular shop, and thereby bring about a more progressive line of thought on bread production methods.

Flour is the most important constituent of bread and for this reason it should be given thorough study in every stage of the game, from wheat (and soil as well) to the finished bread.

All flour varies in its makeup, it always has and always will, so it is self-evident that it is necessary for us to think of a method of handling and fermenting flours which will give us self-protection. Protecting, the miller, our own job, the quality of bread made, and our company.

The first act of starting bread production is to buy some flour. In order to do this intelligently, we should estimate the amount needed per day, per week, or per month, and add to this the time of storage thought desirable.

How long should flour be stored before going to the dough batch?

No doubt your answers to all these questions would be as correct as the answers given, but differences of opinion usually start at least two open-minded people thinking along different lines, from which good ideas and methods often develop.

It is very well known that bleaching with certain bleaching agents and ageing through storage of flour causes a whiter flour and also an increased acid content. The latter reduces the fermentation period as the active acidity increases.

It is believed by the baker that flour should be of a certain temperature, which is above that temperature which could be called cold, say from 70 degrees F. to 80 degrees F. It might be that cold flour would reduce the amount of ice or cold air necessary to mix a dough 15 minutes at 60 R.P.M. with equally good bread results.

It is believed that all moisture lost between the mill rolls and the dough mixer can be regained at the dough mixer. It is quite often necessary to prove our problem by authentic figures. If the regain in moisture loss is absolute, there does not seem to be much use of worrying about controlling the temperature and humidity of the flour storage room. The answer given for flour storage would be from two to three weeks. The fermentation period of the flour is the most important factor concerning us, and it must be determined under any condition of storage.

For sanitary reasons, flour should be stored on skids and spaced for plentiful air circulation on all sides.

It is hard to think that the gluten in wheat grown on different sides of the road won't have anything to do with each other when blended and milled into flour. This would necessarily result if three or four different glutes resulted from the blending of as many flours, because the miller blends different types of wheat to get what he thinks is the best obtainable flour.

It is much easier and more possible to think of the gluten resulting from a blend of wheat, or a blend of flour, as being a composite gluten. In fact, this seems to be the findings of laboratory and plant work.

The conclusion and answer would be that from one to a dozen flours could successfully be used in a blend, providing the fermentation periods of each as well as of the blend were accurately known.

The average of the correct individual fermentation period of flour making up a blend seems to work out successfully in actual production.

The blending of flours in many cases will enable one to keep a more uniform fermentation period providing flour is purchased with this in mind.

If the idea of a composite gluten from a blend of several flours is kept in mind, it would seem plausible to conclude that the total acid resisting property (which, no doubt, is the largest single factor responsible for the variations in the fermentation period of different flours) of the total gluten must be overcome before over-fermentation or old doughs can result.

Again we have the job of finding the correct fermentation period, whether it be a single flour or a blend of many flours.

In talking of the Hydrogen ion concentration of flours, it will be expressed hereafter as the active acidity. Results have shown that as the active acidity increases in the flour, the time necessary for proper fermentation decreases, and as the active acidity in a flour decreases, the fermentation increases.

Flour in a natural sound state never reaches a pH as low as 5.0. After sufficient data is at hand, the pH of a flour will give the approximate fermentation period of that flour.

It seems that the terms "weak" and "strong" flours have been created by an absence of knowledge on our part in not being able to accurately determine the fermentation period of different flours. The term "weak flour" from a psychological standpoint is bad because it always creates a doubt in the baker's mind and lends a ready excuse.

There does not seem to be a method of milling or wheat treatment whereby all flour can be made having a definite fermentation period, which would eliminate the condition of weak and strong flours. A radio that is not selective is not considered of much value, and so it is with us; if we could be more selective in buying flours that would fall within the fermentation conditions of our shops, we would be of more value.

The variations in the fermentation of different flours has brought about the terms "weak" and "strong", but wouldn't it be a little more definite to say flours with a short and long fermentation period, making two hours of fermentation

(straight dough) under the average shop conditions as the dividing line? Then instead of saying, "this flour is weak," it could be stated that "This flour has a fermentation period under two hours."

It does not seem logical to say that after the gluten has once been properly conditioned, whether it has taken two hours or five hours, that the breaking down or over-conditioning of the gluten proceeds faster in one case than in the other, since it is understood that fermentation during this time has been busy overcoming the acid resisting property of the flour. In other words, if a dough from a flour having a fermentation period of two hours is taken at two hours, it should stand as much abuse as the dough from a five hour flour taken at five hours. At least, results have not shown that this margin of difference is large enough to be observed by ordinary bake shop practice.

These questions can be answered in a short time by members of the American Society of Baking Engineers getting busy individually, also collective, and working them out to a definite conclusion.

President Stritzinger says: Do as Eotarians do and sign.