

Stickiness of Bread Dough

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Baking of bread is a large industry in the UK with around 12 million loaves produced and sold each day^[1] and typically a single bakery produces 4 - 8000 units per hour, therefore, any disruptions to production are costly.

Stickiness is a combination of adhesion, the interaction between a material and a surface, and cohesion, the interactions within the material. It is therefore a result of a combination of surface and rheological properties.

Dough stickiness is a major problem in the industry, particularly in large mechanised bakeries, as sticky dough cannot be processed, leading to process disruption and product loss. In less severe cases the dough may still be processed but the product quality is reduced. The sticky dough causes problems in the dividing and moulding stages where dough sticks to the machinery, building up until the machine clogs and must be stopped. At this point the batch will be lost and time is also lost to cleaning.^[2-4]

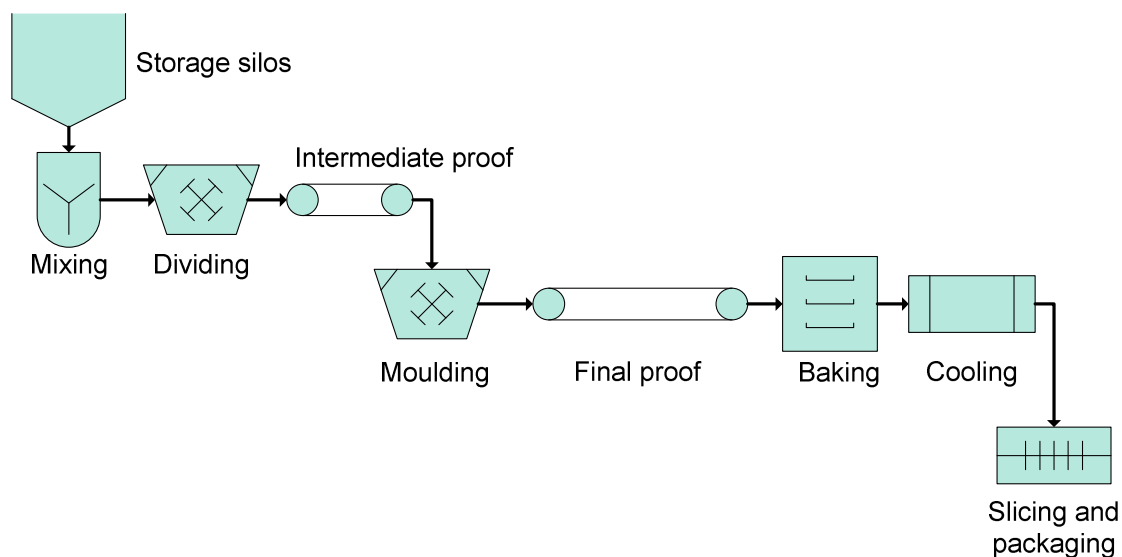


Figure 1: Flowsheet of the bread-making process.

Determining the causes of dough stickiness is difficult as reliable measurement of stickiness is hard to achieve and there is no universal measure for stickiness within the food industry. Stickiness is usually determined subjectively based on the results of manually handling the dough. Any measurements that are done are usually empirical and limited in applicability to the conditions under which the test was performed. Reliable testing is difficult as, for

example, in probe tests there are issues associated with consistently separating the dough cleanly from the probe. There have also been problems distinguishing between surface and bulk contributions in such tests. ^[3, 5]

The aims of this project are as follows:

- (1) To develop a predictive test for the industry, to be used on site to determine whether a batch will be sticky.
- (2) To characterise the properties of bread dough with particular emphasis on the adhesive properties.
- (3) To investigate the causes of dough stickiness.
- (4) To investigate the possibility of reworking sticky dough to allow the dough to be processed.

References

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