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Dynamic study of rising and baking bread dough

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Australia is a major wheat producer for the domestic and international market. Properties of wheat and its suitability for bread-making varies depending on the variety and the region where it was grown. Bread-making performance can also be significantly affected by dough additives including different salts.

Previous studies have analysed dough structure using micro-CT but few have looked at the dynamics of the complete proofing and baking process in situ. In this study we use the high-speed imaging capability of the Imaging and Medical Beamline to observe the dynamic of rising and baking in a series of bread dough formulations made from high and low protein flour with different salt additives. We were able to observe this process in 16 different samples with scans at 29 time-points for each sample during 2 hours of proofing and around 30 min of baking.

Using Avizo we developed automated scripts for analysis of this huge amount of data to extract features such as void-size and wall thickness. We also have attempted to identify the points at which voids burst and connect with one another.

With this we can discover the effect of different formulations on dough performance. The long term aim of which is to improve formulations to boost the value obtained from Australian flour.

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