

Application Data

Using C-Cell data in wheat breeding programmes

Description

Being able to obtain objective data on the breadmaking potential of new wheat varieties has significant benefits for wheat breeders, millers and bakers. With C-Cell data breeders are able to monitor the breadmaking performance at the earliest stages of development as the measurements are applicable to all sizes and types of loaves made using any type of breadmaking process. The objective data allow tracking of individual varieties as they progress through field trials and make it easy to carry out comparisons of the breadmaking potential between varieties.

Data

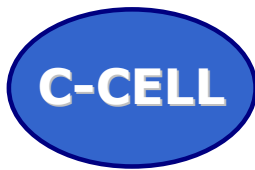
C-Cell measures up to 48 different parameters which are relevant to breadmaking. Combinations of these parameters may be used to provide a single objective score related to the gas retention potential of a flour sample which in turn, helps identify the breadmaking potential of a wheat variety. Data may be obtained in white and wholemeal flours and the photos provide a permanent record of bread character.

Key C-Cell parameters in understanding the gas retention properties of a wheat flour dough include:

- **Slice area and height as these can be related to bread volume**
- **Concavity which is influenced by gas retention.**
- **Numbers of cells, average cell diameter and average cell wall thickness as these parameters are indicative of the ability of the gluten network to impact gas bubble coalescence during baking. Such overall differences are hard to detect with the human eye.**
- **Crumb brightness though this is not a true measure of colour it is influenced by endosperm colour (lower values indicate darker crumb colour).**

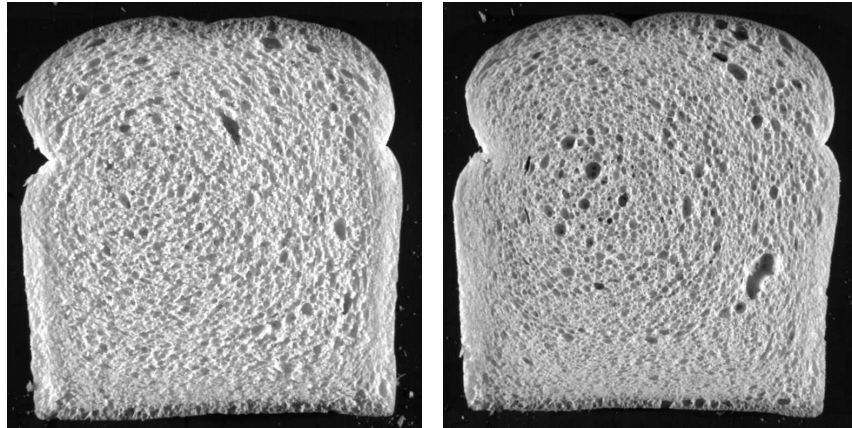
Images

The processed images overpage provide valuable visual information about the quality parameters



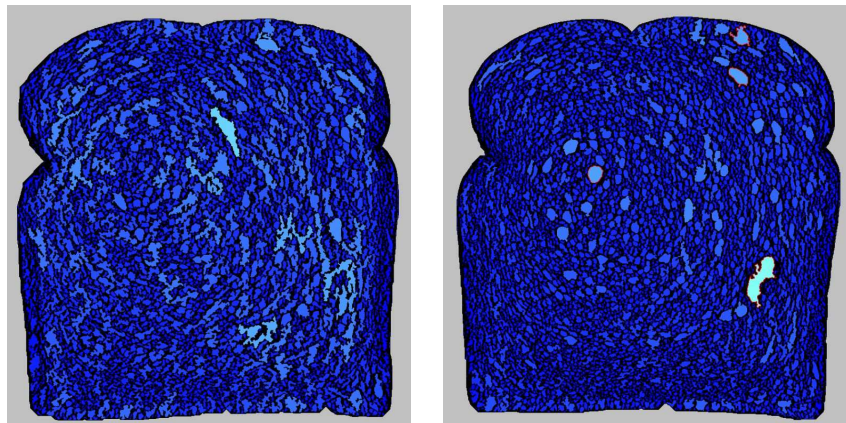
Application Data

Slice dimensions:



| | | |
|---------------------------------------|--------------|--------------|
| Slice area (mm²) | 10966 | 10747 |
| Average slice height (mm) | 111 | 109 |
| Left & right concavity (%) | 1.28 | 1.29 |

Cell Image: The individual cells with the slice image are identified and variations in cell sizes are colour coded; small cells are coloured dark blue and larger ones are shown in lighter shades of blue, green and yellow. Cells walls are indicated by black lines.



| | | |
|-------------------------------------|--------------|--------------|
| Number of cells | 6091 | 7759 |
| Avg cell diameter (mm) | 2.136 | 1.564 |
| Avg cell wall thickness (mm) | 0.463 | 0.414 |

Comparing the two sets of data we can see that samples A and B reached a similar volume and shape but the lower number of cells, larger average cell size and higher average cell thickness with sample A shows that the gluten network was not as effective at limiting gas bubble coalescence as in sample B. This comparison shows that while both samples would give satisfactory loaf volume the baker would still see a difference in overall bread quality.

More information is available from:

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