

## Quantification of Extrusion in Snack Foods

### What C-Cell Does:

C-Cell allows you to quantify cellular changes within snack foods and maize based products. Example results taken from samples prepared on a twin screw extruder, using different screw speeds and calcium carbonate:

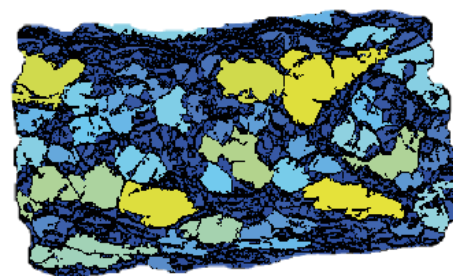
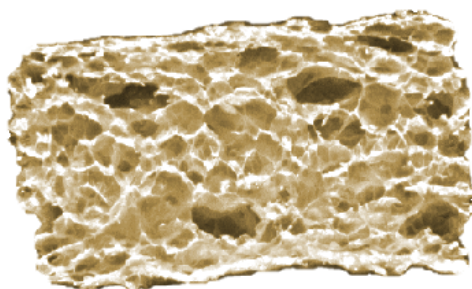
Screw	0% CaCO <sub>3</sub>		1% CaCO <sub>3</sub>	
Speed	Cell Diameter mm		Cell Diameter mm	
	Transverse	Longitudinal	Transverse	Longitudinal
250	1.81	2.29	1.87	1.86
300	1.33	1.76	1.28	1.52
350	0.99	1.38	1.11	1.46

### How C-Cell can help you:

- Quality control
- Identify problems in the process
- Visual results with process images and numerical data.
- Easy to use
- Quick results
- Laboratory based analyser

### Summary:

C-Cell is an easy to use food image analyser which enables you to diagnose problems within the extrusion process. Results are given quickly enabling efficient feedback to production. C-Cell shows the effect on cell structure of changes to raw material.



## Example of Process Data

Results - Upright orientation			
Dimension			
Slice Area	134mm <sup>2</sup>	Height (Max)	13.3mm
Height Average	12.6 mm	Breadth	13.2mm
Height / Breadth	1.01	Wrapper Length	41.6mm
Brightness			
Slice Brightness	112.2	Cell Contrast	0.672
Cell Size			
Number of Cells	2119	Number of Holes	0
Area Of Cells	58.7%	Area of Holes	0%
Cell Diameter	1.12mm	Cell Volume	23.87
Coarse Cell Volume	40.05	Volume of Holes	0
Cell Volume (Map)	75	Cell Vol Range (Map)	68
Relative Volume Range	0.91	Coarse/Fine Clustering	0.146
Wall Thickness	0.092mm	Non-Uniformity	3.426
Cell Elongation and Orientation			
Average Cell Elongation	1.46	Net Cell Elongation	1.19
Cell Angle to Vertical	86.9	Cell Alignment	0.191
Vertical Elongation	-0.188	Degree of Circulation	0.5
Circulation Horiz Offset	0%	Circulation Vert Offset	0%