Production: PASTRY

Objective: Comparison of biaxial extensibility of three types of pastry

Type of action: Burst test

Test setting:

Speed	Test mode	Trigger	Target	Hold
0.5 mm/s	Distance (c)	5 gf	75 mm	0 sec

Accessory:

Dough puncture rig, Platform

Sample Preparation:

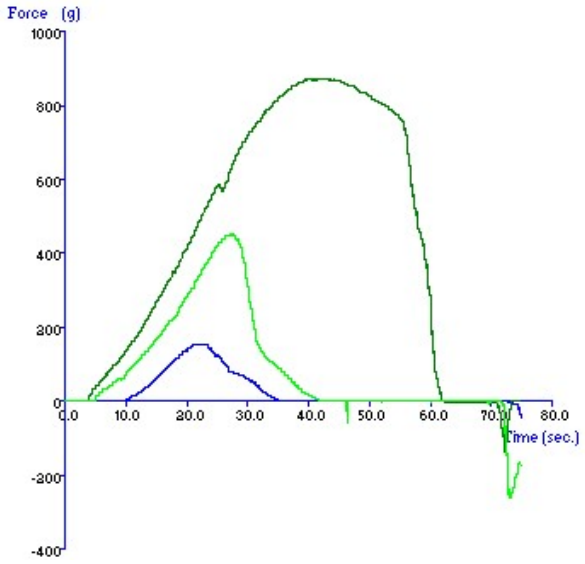
Remove the pastry from its specified storage temperature just prior to testing and roll to a constant thickness. Filo pastry is an exception as it is generally rolled out into very thin sheets. To improve reproducibility of filo pastry several layers may be tested together e.g. two.

Test Set-Up:

Position the Heavy Duty Platform centrally under the spherical probe. Unscrew and remove the top plate of the tortilla/pastry burst rig. Place the pastry on top of the middle plate ensuring that it completely covers the hole. Replace the top plate and clamp the sample in place by tightening the screws through the sample. When doing this one must try to minimise the slack in the sample over the hole without stretching the sample.

Run the test immediately before the sample starts to dry out.

Typical plots:



The above curves were produced from 3 different types of pastry: Puff, Shortcrust and Filo, tested at 5C.

Observations:
Once the trigger force is attained the graph proceeds to plot the effect on the pastry under tension. When the elastic limit is exceeded the pastry breaks (observed as the maximum tension force). The greater the distance at the break the more extensible the sample. It is clear that the puff pastry sample is both more extensible and requires a greater force to stretch (therefore is tougher) than the shortcrust and filo pastry samples.

Data Analysis:

☒Max Force

☒Peak Distance

Results

Pastry Type	Mean Max. Force 'Toughness' (+/- S.D.) (g)	Mean Distance at Break 'Extensibility' (+/- S.D.) (mm)
Filo	161.6 +/- 14.8	23.2 +/- 1.6
Puff	899.6 +/- 28.2	43.3 +/- 0.8
Shortcrust	453.3 +/- 30.5	28.0 +/- 1.8

Notes:

- Before commencing each test, consideration should be taken to ensure that there are no apparent weaknesses along the exposed sample area. Such weakened areas would result in lower break forces and distance of break values.
- To make it easier to clamp the sample, double-sided tape may be placed on the underside of the middle plate to secure it to the Heavy Duty Platform thereby aligning the screw holes.
- It may be necessary to dust the pastry or ball probe with flour to minimise stickiness, as adherence to the ball probe during testing would produce erroneous results.
- Storage, packaging and handling of the sample before testing are considered variable conditions. It is important to identify these conditions when reporting results and they should be kept constant for comparison purposes.
- When attempting to optimise test settings it is suggested that the first tests are performed on the hardest samples to anticipate the maximum testing range required and ensure that the force capacity allows testing of all future samples.