

Production: TORTILLAS

Objective: Comparison of biaxial extensibility of two formulations of wheat flour tortillas

Type of action: Burst test

Test setting:

Speed	Test mode	Trigger	Target	Hold
1 mm/s	Distance (c)	5 gf	40 mm	0 sec

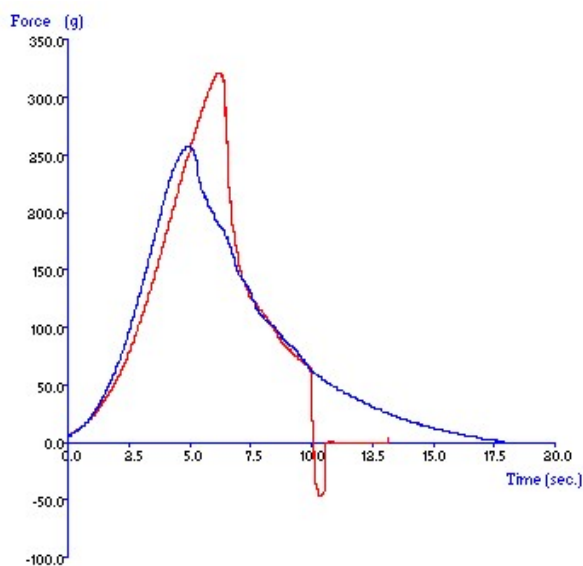
Accessory:

Dough puncture rig, Platform

Test Set-Up:

Position the Heavy Duty Platform so that the ball probe is centralised. Unscrew and remove the top plate of the tortilla/pastry burst rig. Remove the tortilla from its place of storage just prior to testing and place 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 two different formulations of wheat flour tortillas, tested at 20C.

Observations:

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

Data Analysis:

- ☒ Max Force
☒ Peak Distance

Results

Tortilla Type	Mean Max. Force 'Toughness' (+/- S.D.) (g)	Mean Distance at Break 'Extensibility' (+/- S.D.) (mm)
A	264.5 +/- 29.6	12.5 +/- 0.7
B	240.0 +/- 22.1	10.4 +/- 0.9

Notes:

- Before commencing each test, consideration should be taken to ensure that there are no apparent weaknesses along the exposed sample area. This can be achieved by holding the tortilla up to a light source and selecting a uniform area avoiding under-baked or over-baked areas. Testing 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 tortilla or ball probe with flour to minimise stickiness, as adherence to the ball probe during testing would produce erroneous results.
- When analysing the results the variation in break distance values may be found to be quite high. This is due to the inherent non-homogeneous texture of tortillas.
- 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.