Production: BREADCRUMBS

Objective: Firmness measurement of breadcrumbs by compression with a cylinder probe

Type of action: Compression test

Test mode settings:

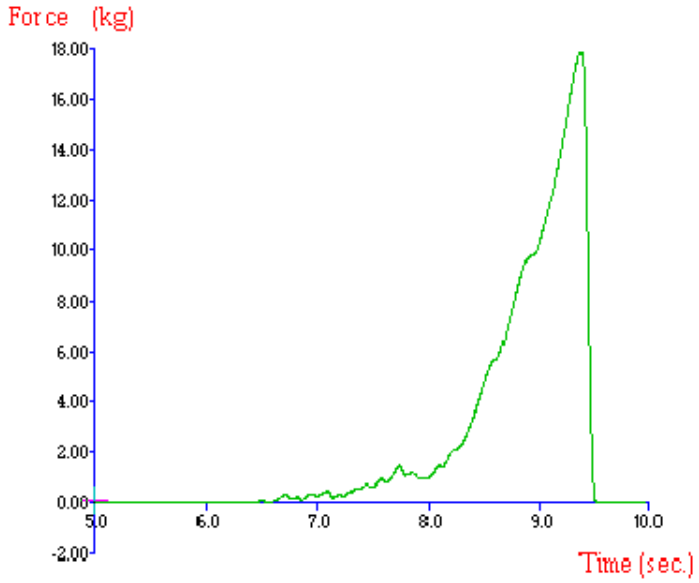
Speed	Test mode	Trigger	Target	Hold
1 mm/s	Distance (c)	0 gf	9.5 mm	0 sec

Accessory:
ϕ 36 mm cylinder probe, Platform

Sample Preparation:
Cut strips of adhesive tape approximately 50mm x 150mm. Attach tabs of paper to the ends of the adhesive strips so that they can be easily moved. Place the strips of tape (adhesive side upwards) onto a clean surface and gently pour the sample over the tape. After application of the sample, lift the tape and gently shake to ensure an even covering of the surface. Tip the excess sample off.

Test Set-Up:
Before testing, the probe must be calibrated against the machine base and returned to a set distance e.g. 10mm. (It is important to start all tests from the same distance above the machine base for comparison when a button trigger is specified). The prepared tapes are placed under the clean probe, after ensuring the surface under the tape is completely flat and clean of debris, which would produce erroneous results. The compression test is commenced and repeated on other regions of the tape.

Typical plots:



The above curve was produced from compressing breadcrumbs of white pan bread.

Observations:
Once the test is commenced (from a starting point of 10mm above the machine base) the probe proceeds to move down towards the sample. On contact with the sample a rise in force is observed as the probe continues to compress the sample. This rise in force continues until the probe has moved down 9.5mm (i.e 0.5mm above the machine base), at which point the breadcrumbs have yielded and the sample has been compressed. The maximum force is taken as the 'hardness' of the sample. The probe then proceeds to return to its initial starting point.

Data Analysis:

☒Max Force

Results

Sample	Mean Maximum Force 'Hardness' (+/- S.D.) (kg)
A	17.3 +/- 1.5

Notes:

- The probe must not be moved manually after each test - the calibrated starting point e.g. 10mm above the base is essential for comparison of tests.
- For samples of larger crumb size or harder consistency the distance to which the probe compresses would perhaps need to be reduced e.g. 9.5 to 9.2mm, to avoid overloading.