

Production: TOFU

Objective: Comparison of the shearing force of four different kinds of tofu using a guillotine blade

Type of action: Cutting test

Test mode settings:

Speed	Test mode	Trigger	Target	Hold
2 mm/s	Distance (c)	25 gf	5 mm	0 sec

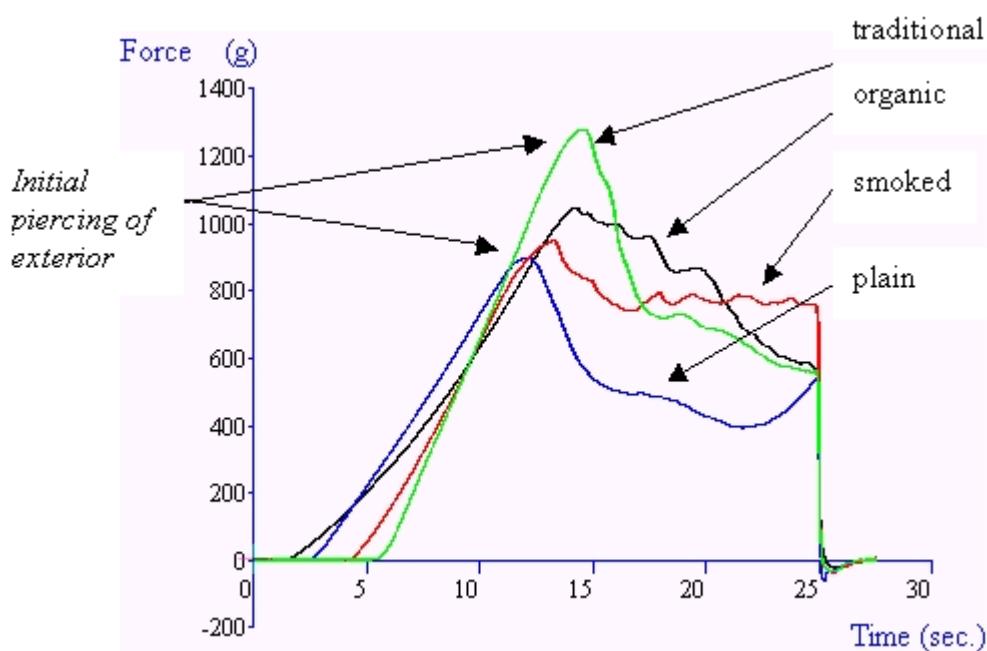
Accessory:

Extended Craft Knife, Platform

Test Set-Up:

The guillotine blade is attached to the load cell carrier and Heavy Duty Platform (HDP) onto the instrument base. The blade is calibrated with the base (Calibrate Height) to return to 30mm above, this value is set in the Control Probe feature. The tofu is removed from the place of storage just prior to testing and its' packaging then cut into 2 sample strips, each with a 40mm width. A sample strip is positioned perpendicular to the blade and 3 tests are performed onto it (towards each end and a central one, ensuring that they are equidistant and not too close to each other or the edges).

Typical plots:



The above curves were produced from shearing four different kinds of tofu tested at room temperature straight after removal from the refrigerator at 5C.

Observations:

Upon starting the test, the guillotine proceeds to move down to a depth of 25 mm during which the sample is sheared to within 5 mm of its' base. At this point (maximum force), the probe returns to its' original position at maximum speed (10 mm/s). The graph curves and results analysis indicate that the traditional tofu is the hardest to shear, followed by the organic, then smoked and plain respectively. The macro analyses just the maximum force value because the sample interior is variable (due to being fibrous) and the standard deviation is quite high for the traditional and organic tofu types indicating an inconsistent quality.

Data Analysis:

☒Max Force

Results

Tofu type	Mean Maximum Force 'Hardness' (S.D.) (g)
Traditional	1337.3 +/- 207.7
Organic	1030.6 +/- 155.5
Smoked	932.8 +/- 71.0
Plain	885.8 +/- 76.5

Notes:

- It is important that the shearing depth, does not go further than within 1mm of its' base, otherwise the platform base effect may be observed, thus producing an incorrect force profile. The Heavy Duty Platform is used to prevent heat transfer from the instrument base into the sample.
- A removable Perspex-type sheet can be used on top of the HDP to make ease of cleaning and transportation of the sample strips between tests. If using this, the sample strip may be lifted-up during the probe withdrawal stage. This can be prevented by physically holding onto the removable sheet.
- When attempting to optimize 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.