Application manual No. 083

Production: HYDRATED SWEETCORN

Objective: Firmness of Hydrated Sweet corn

Type of action: Cutting test

Test mode settings:

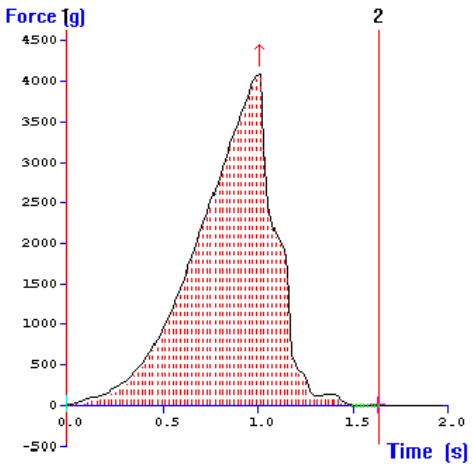
Speed	Test mode	Trigger	Target	Hold
2 mm/s	Strain (c)	5 gf	50 %	0 sec

Accessory:
Simulated incisors rig, Platform

Test Set-Up:
Secure the lower Simulated incisors rig into the Heavy Duty Platform, which is loosely fixed onto the machine base. Adjust the position of the Heavy Duty Platform accordingly to ensure that the upper jaw is directly above the lower jaw. Calibrate the upper jaw to acknowledge the height of the lower jaw. This accounts for the variable heights of the samples as the compression is to be carried out in strain. The objective of doing this is to ensure that the jaws do not touch each other during the test. To do this, lower the upper jaw to just above the lower jaw. Click on Calibrate Height. Specify the distance that you want the probe to return when it has finished the test - this is usually a few millimeters higher than the height of the sample e.g. 8mm.

Select 'uniform' corn kernels, i.e. possessing two relatively flat surfaces. Place a kernel centrally on the lower jaw bar and hold carefully in place with the fingers. Commence the test. Remove fingers as soon as the upper jaw begins to penetrate the sample.

Typical plots:



The above curve was produced from a tinned sweet corn kernel, tested at 5C.

Observations:
Once the trigger force of 5g is attained, the upper jaw proceeds to penetrate the sample this is the yield point of the corn surface, and is indicated by the maximum force. Following this, the force profile is as a result of penetration into much softer tissue.

Data Analysis:
☒Max Force

Results

Sample	Mean Max. Force 'Firmness' (+/- S.D.) (g)
A	4255.9 +/- 476.6

Notes:

- The term 'firmness' may also be referred to as 'hardness'.
- The area under the curve can also be calculated by dropping anchors at the beginning and end of the curve. The area corresponds to the 'work of shearing' and usually ranks different samples in the same order as the maximum force.
- 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.
- Difference in sweet corn hardness values may be as a result of one or more of the following factors:

  - Harvest time
  - Sweet corn varieties
  - Blanching time
  - Calcium content of water in which sweet corn is stored in can