

Bagel Firmness by Compression, *AIB Standard Procedure*

TVT Texture Analyzer

The TVT Texture Analyzer (Figure 1) offers rapid and objective analysis for different products. The following parameters can be characterized for your product category:

- Firmness
- Springiness

Both international standard methods as well as customer tailor-made profiles are available.



Figure 1: TVT Texture Analyzer

Scope

- Determination of bagel crumb firmness by single cycle compression, AIB Standard Procedure (AIB).

Method Description

The recording of the measurement data commences once the probe reaches the pre-set trigger force. The probe will then compress the sample to a pre-defined distance. After compression, the probe returns to its starting position.

Calibration

Make sure the instrument is correct calibrated before the measurements. How to perform the calibration can be found in the User's Manual.

Load cell (recommended) 5 – 10kg

Probe

P-CY18R, Cylinder probe 18 mm diameter, rounded edges stainless steel (Figure 2)
Part number: 67.30.18



Figure 2: P-CY18R

Profile settings

Setting Parameter

Single Cycle Compression

| | |
|------------------------------------|------|
| Sample height [mm] | 26.0 |
| Starting distance from sample [mm] | 5.0 |
| Compression [mm] | 6.2 |
| Initial speed [mm/s] | 2.0 |
| Test speed [mm/s] | 1.7 |
| Retract speed [mm/s] | 10.0 |
| Trigger force [g] | 10 |
| Data rate [pps] | 200 |

Sample preparation

Let new-baked bagels cool down for 1 hour in room temperature before being packed in double bags. Store the packed bagels in room temperature until further testing. Texture measurements are most commonly performed at day 1, 3 and 7 after baking. Slice the bagels in 26 mm thick slices (Figure 3a), preferably by using a template to ensure a correct thickness. Use ~5 bagels for every testing day. Place the sample on the measuring table below the probe (Figure 3b). Each bagel can be used for 3-5 measurements, resulting in 15-25 peaks per test day.

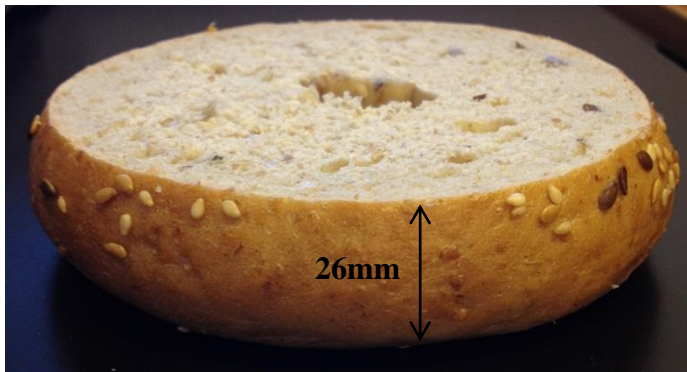


Figure 3: a, Sample size



b, Sample set-up

Curve Description

In Figure 4 a typical Force-Distance curve is illustrated. The maximum peak⁺ force value is here used for the firmness.

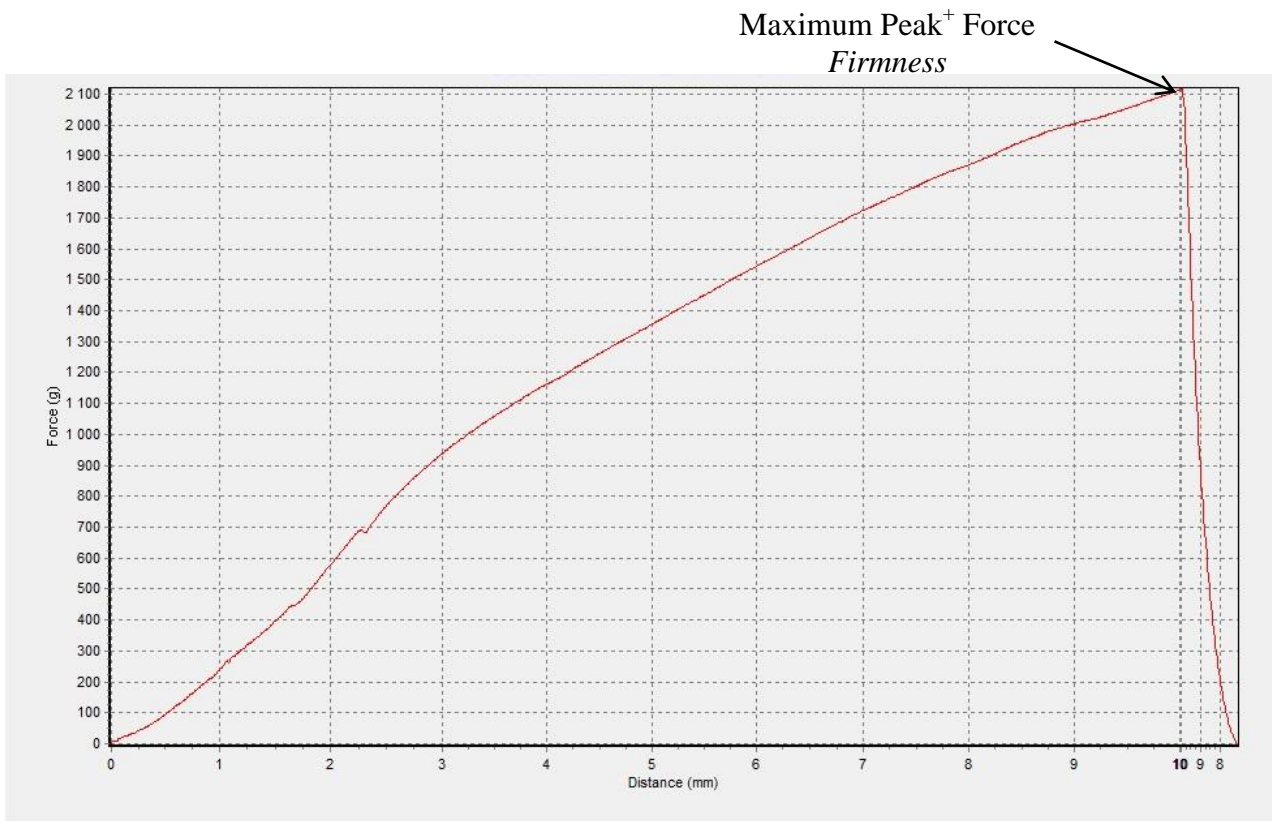


Figure 4: Compression of bagel crumb

Data Analysis

The force required to compress the sample to a certain distance is here defined as firmness and can be measured in the units [g] or [N]. Except raw data (force, time and distance) the program also directly provides calculated results such as *mean value* and *standard deviation*.

Reference

AIB Bagel Firmness Measurement. AIB – American Institute of Baking. Lab in Manhattan, Kansas.
<https://www.aibonline.org/aibOnline/Documents/EN/DevelopYourProductSolutions/AIBTextureAnalysisProcedures.pdf> (2017-03-01)