Table Olives Firmness & Resilience, by Compression

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:

- Hardness/Firmness
- Consistency
- Resilience

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

Figure 1: TVT Texture Analyzer

Scope
- Determination of firmness and resilience of table olives by single cycle compression test.

Method Description
The recording of the measurement data commences once the probe reaches the pre-set trigger force. The probe will then penetrate 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 – 10 kg

Probe
P-CP35S, Compression plate 35 mm diameter, stainless steel (Figure 2)
Part number: 67.20.35

Figure 2: P-CP35S
Profile settings
Setting Parameter
Single Cycle Compression

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample height [mm]</td>
<td>20.0</td>
</tr>
<tr>
<td>Starting distance from sample [mm]</td>
<td>5.0</td>
</tr>
<tr>
<td>Compression [mm]</td>
<td>7.00</td>
</tr>
<tr>
<td>Initial speed [mm/s]</td>
<td>1.2</td>
</tr>
<tr>
<td>Test speed [mm/s]</td>
<td>1.0</td>
</tr>
<tr>
<td>Retract speed [mm/s]</td>
<td>1.0</td>
</tr>
<tr>
<td>Trigger force [g]</td>
<td>5</td>
</tr>
<tr>
<td>Data rate [pps]</td>
<td>250</td>
</tr>
</tbody>
</table>

Sample preparation
Take the samples from their packaging just before testing. If wet, wipe them off carefully. Place the sample centrally under the probe and start the test, Figure 3. Sample temperature will influence the results and should thereby be kept constant.

Figure 3: Sample set-up

Curve Description
In Figure 4 typical Force-Time curves are illustrated. Maximum peak force is here defined as the firmness of the sample, while the total area is the work of compression. Resilience is the ratio between the withdraw area and compression area.

\[
\frac{\text{Area } a_2}{\text{Area } a_1} \times 100\% = \text{Resilience}
\]
It is here clearly shown that the two olives had different texture properties. The mid-cost olive (blue curve) cracked during compression while the low-cost olives (pink curve) did not.

Figure 4: Blue curve: Table olives from a mid-cost brand, Pink curve: Table olives from a low-cost brand.

**Data Analysis**

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