

Cooked Pasta Firmness Analysis

Firmness testing of cooked pasta is crucial for quality control, as it provides a measure of texture that correlates with consumer preference. By evaluating the hardness and work done to shear the pasta, manufacturers can ensure consistent product texture and quality.

Background:

- Durum wheat is commonly used in pasta production, with glutenin and gliadin proteins contributing to dough strength and elasticity. The interaction of these proteins forms a gluten network, which impacts the texture and firmness of pasta after cooking.
- Cooked pasta firmness is assessed using a Kramer Shear Cell, which measures the force needed to compress and shear pasta, reflecting its hardness.



Equipment:

- CTX Texture Analyzer with a 50 kg load cell
- Components: Kramer Shear Cell (TA-KSC) with blades, Fixture Base Table
- Software: Texture Pro for test parameter control and data recording

Settings:

- Test Type: Compression
- Pre-Test Speed: 1.0 mm/s
- Test Speed: 2.0 mm/s
- Post-Test Speed: 2.0 mm/s
- Target Distance: 40 mm
- Trigger Force: 30 g

Sample Preparation:

1. Cook pasta by placing 120 g in 500 ml of boiling water for 12 minutes, stirring occasionally.
2. After cooking, drain and rinse with water for 30 seconds, then transfer pasta to a beaker of water before testing.
3. Weigh 100 g of the cooked pasta for the test and evenly distribute it within the shear cell.

Procedure:

1. Attach the blades to the probe shaft.
2. Place the fixture base table on the instrument and secure the shear cell, ensuring blade alignment with the cell slots.
3. Position the pasta in the shear cell and align the blades just above the sample.
4. Initiate the test, allowing the blades to compress and shear the pasta over the set distance.
5. Clean the blades and cell between tests to prevent sample contamination.

Observations:

- Figure 1: Load vs. Time graph shows the hardness of cooked pasta.
 - The maximum force on this graph represents pasta firmness.
- Figure 2: Load vs. Distance graph provides an alternative display of results.
 - Maximum force indicates sample hardness, and the area under the curve reflects the work done to compress and shear the pasta.

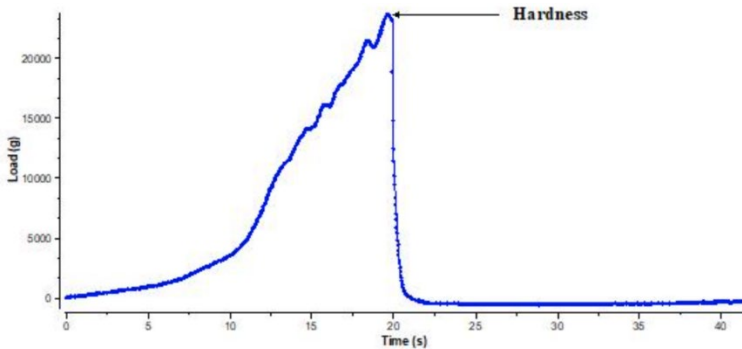


Figure 1



Figure 2

Results:

- Hardness: 23,670 g
- Work Done: 2943.6 mJ

Sample	Hardness (g)	Work Done (mJ)
Cooked Penne Pasta	23670	2943.6

Discussion:

The peak force measures pasta firmness, representing the effort needed to compress the sample between teeth, while the work done corresponds to the energy required to shear it. This test helps ensure that cooked pasta meets texture standards, aiding in quality control for consistency across production batches.