

Cooked Rice Firmness and Stickiness Analysis

Testing the firmness and stickiness of cooked rice is essential to ensure consistent texture quality, especially for consumer satisfaction and culinary standards. Measuring hardness and stickiness provides insights into the chewability and cohesiveness of rice, vital for quality control in food production.

Background:

- Cooked rice texture varies based on factors like starch content, gelatinization temperature, and amylose levels, influencing firmness and stickiness. Indica (long grain) rice, with high amylose, tends to be firmer, while Japonica (short grain) rice is generally stickier due to lower amylose content.



Equipment:

- CTX Texture Analyzer with 5 kg load cell
- Components: Cylinder Probe (for compression), Fixture Base Table, Base Plate
- Software: Texture Pro for test parameter control and data recording

Settings:

- Test Type: Compression
- Pre-Test Speed: 1.0 mm/s
- Test Speed: 1.0 mm/s
- Post-Test Speed: 1.0 mm/s
- Target Deformation: 60% of sample height
- Trigger Load: 4.5 g

Sample Preparation:

1. Boil one cup of rice in two cups of water for 20 minutes, then cool for 5 minutes.
2. Place three grains of cooked rice on the base plate, taking samples from similar locations for consistency.

Procedure:

1. Attach the cylinder probe to the instrument.
2. Place the fixture base table and insert the base plate, tightening the setup.
3. Align the rice grains centrally under the probe.
4. Initiate the test; the probe will compress the sample to 60% deformation.
5. Clean the probe and base plate between samples.

Observations:

- Figure 1: Load vs. Time graph shows the firmness of rice, with the peak force representing hardness.
- Figure 2: Load vs. Distance graph displays work done during compression. The absence of a negative peak indicates minimal stickiness.

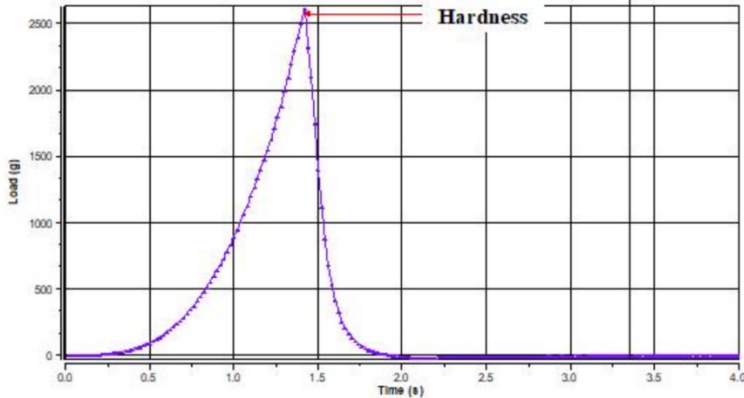


Figure 1

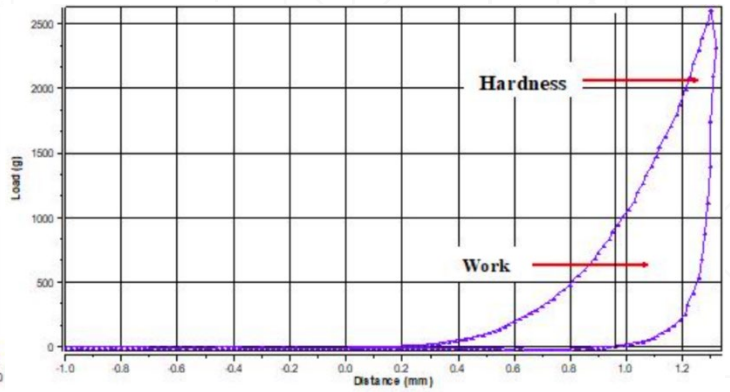


Figure 2

Results:

- Average Hardness: 2496.9 g
- Work Done: 7.29 mJ
- Adhesive Force: 8.3 g
- Adhesiveness: 0.06 mJ

Sample	Hardness (g)	Work Done (mJ)	Adhesive Force(g)	Adhesiveness (mJ)
Cooked Rice	2496.9	7.29	8.3	0.06

Discussion:

The maximum force reflects rice firmness, important for chewability, while work done shows the energy needed for breakdown. Low stickiness values confirm the sample's low adhesiveness, aiding in quality assessments for desirable texture profiles.