

Cooked Meat Texture Analysis

This analysis will evaluate the hardness/firmness of cooked meat using a five-bladed Kramer Shear Cell (TA-KSC).

Background:

Meat texture is influenced by:

- Water holding capacity (WHC): High WHC = stronger, drier texture; low WHC = softer, moister texture.
- Fat marbling: Softens texture; excessive marbling = watery, less firm texture.
- Connective tissue: Higher content = coarser, harder texture.
- Kramer Shear Cell provides objective measurement by combining compression, shearing, and extrusion methods.



Equipment:

- CTX Texture Analyzer with 50 kg load cell
- Kramer Shear Cell (TA-KSC002)
- Fixture Base Table (TA-BT-KIT)
- Texture Pro Software

Test Settings:

- Type: Compression
- Speeds: Pre-test, test, and post-test at 2.0 mm/s
- Target: Deformation of 30 mm
- Trigger Load: 5 g

Sample Preparation:

- Remove samples from storage just before testing.
- Weigh equal amounts for consistent testing.



Procedure:

1. Attach the probe with blades to the instrument shaft.
2. Position the fixture base table, leaving it slightly mobile.
3. Fix Kramer Shear Cell to the table, aligning blades with the cell slots.
4. Tighten the table once aligned; remove blades to place the sample.
5. Insert sample, reattach blades, and lower them close to the sample surface.
6. Run the test.
7. Clean the fixture between samples to prevent cross-contamination.

Observations:

- At a 5 g trigger load, blades compress and penetrate the meat at 2 mm/s to 30 mm depth.
- Load vs. Time Graph (Fig. 1): Measures sample hardness/firmness.
- Load vs. Distance Graph (Fig. 2): Indicates work done; area under graph = energy required to shear sample.

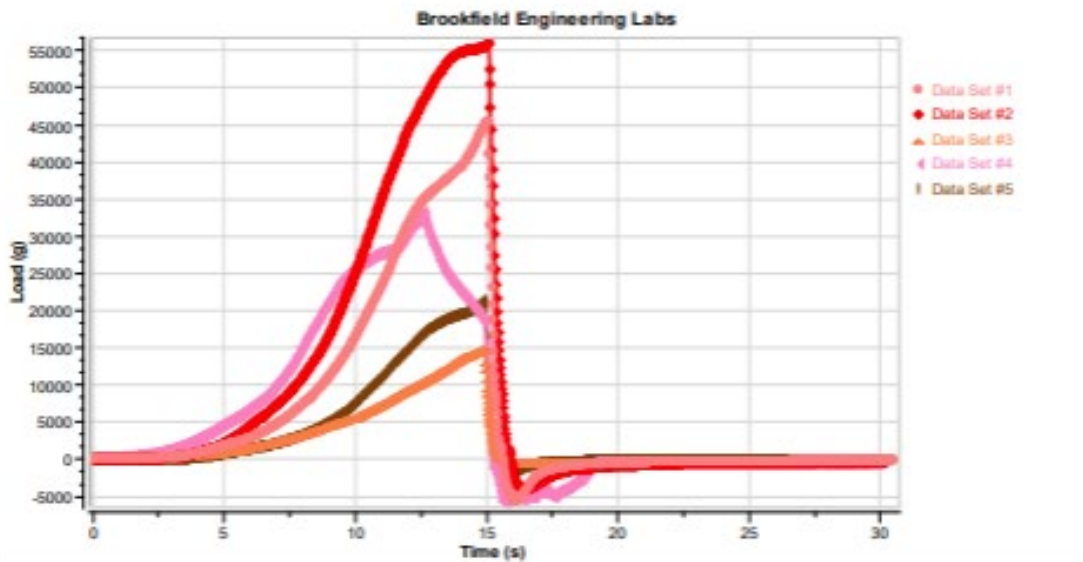


Figure 1: The load/time graph for the hardness/firmness of meat using the five-bladed Kramer Shear Cell with 30 g meat samples.

The maximum peak force is a measure of sample hardness/firmness.

Data Set # 1: Lindon Delivery 30-9 95 VL Chuck BB 6-10

Data Set # 2: Lindon Delivery 30-9 95 VL Chuck BB 6=7-10

Data Set # 3: Cooked Chicken

Data Set # 4: 95 VL Lindon SV

Data Set # 5: Diced Skirt

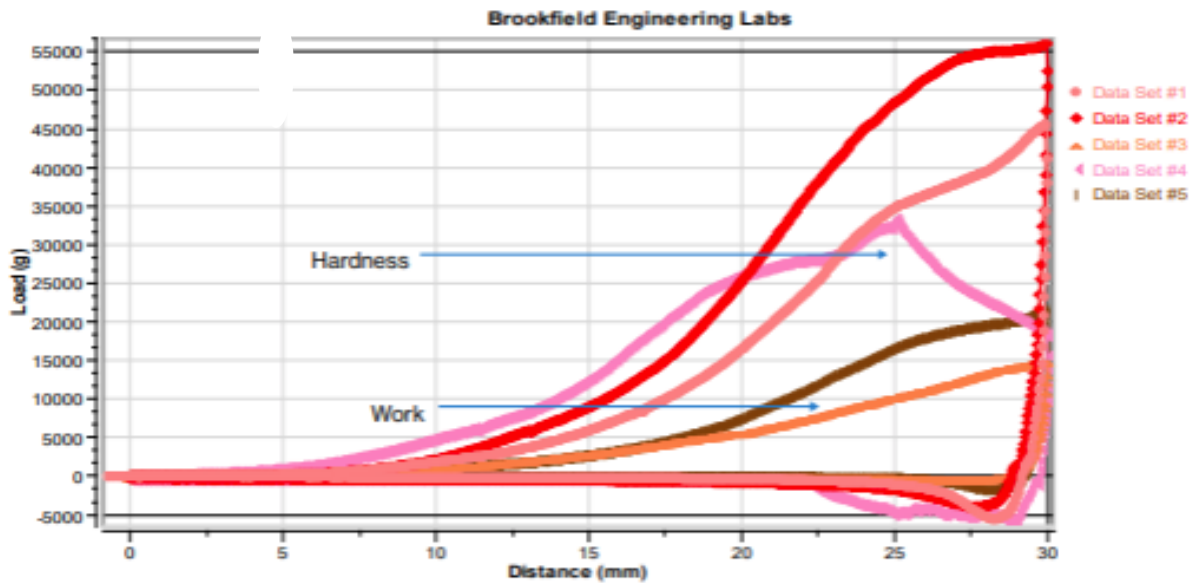


Figure 2: The load/distance graph for the hardness/firmness of 30 g meat

Results:

- Maximum force indicates sample firmness; higher values = firmer meat (Fig. 1).
- Work done reflects the energy needed to break internal bonds; higher values = tougher meat (Fig. 2).
- Firmest Sample: Lindon Delivery 30-9 95 VL 7-10 batch.
- Least Firm Sample: Cooked Chicken.

The table below summarizes the results:

Sample	Hardness (g)	Work Done (mJ)
Lindon Delivery 30-9 95V1 JS Chuck BB 6-10	47089 ± 5004	4631.5 ± 615.5
Lindon Delivery 30-9 95V1 JS Chuck BB 7-10	57250 ± 2195	5551.5 ± 186.7
Cooked Chicken	14548 ± 600	1344.3 ± 29.4
95 VL Lindon SV	31468 ± 4218	4008.8 ± 461.6
Diced Skirt	21414 ± 6781	2065.7 ± 738.1

Discussion:

- Maximum peak force correlates with the force needed to compress meat (firmness).
- Area under the curve indicates the work done, correlating with energy required to break down the sample.

Conclusion:

- The texture analysis provides objective measures for cooked meat's hardness and firmness.
- Consistent sample preparation and testing procedures ensure reproducibility.