

Nutrition Bar Texture Analysis

This analysis will assess texture consistency of nutrition bars using the CTX Texture Analyzer with a 1 kg load cell and Three-Point Bend Accessory (TA-TPB).

Background:

- Nutrition bars target diverse consumers (athletes, children, elderly) and provide specific nutritional or physiological benefits.
- Ingredients such as dry fruits, grains, syrups, and fillers (e.g., hydrocolloids) allow for varied textures, from chewy to crunchy.
- Maintaining consistent texture during shelf life is challenging due to chemical, biological, and physical changes during storage.



Moisture Content and Protein Type:

- High-protein bars tend to harden over time due to water migration from binders (syrups) into proteins and other dry ingredients, affecting texture.

Test Method:

- Evaluates the impact of different formulations on the texture of nutrition bars.
- Useful for production consistency, shelf-life studies, and optimizing textural attributes.

Equipment:

- CTX Texture Analyzer with 1 kg load cell
- Three-Point Bend Accessory (TA-TPB)



Key Measurements:

- Hardness: Maximum force required to bite, fracture, and break the bar (Fig. 1).
- Snap Strength (Work Done): Energy required to fracture the bar (area under the force vs. distance graph up to 20 mm target distance) (Fig. 2).
- Crunchiness: Indicated by fluctuations in the force graph and the number of fractures (Fig. 2).

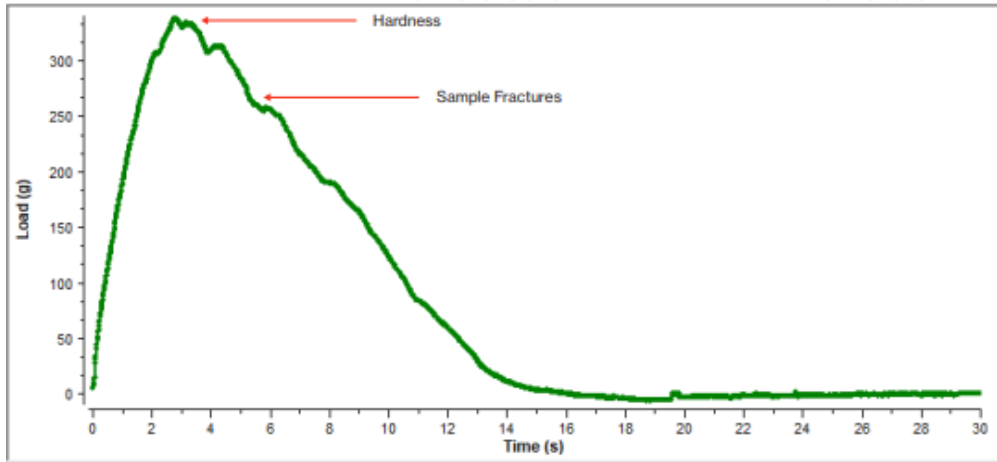


Figure 1. The hardness of a 50 x 37 mm nutrition bar using a Three-Point Bend Accessory.

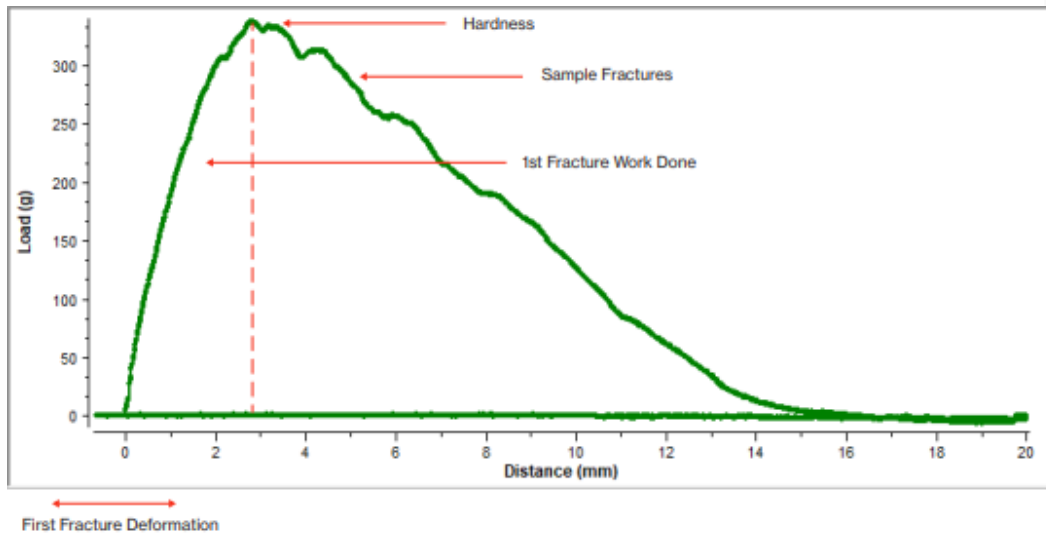


Figure 2. The Force versus Distance graph for the firmness and flexibility of a 50 x 37 mm nutrition bar.

Results:

- Hardness: 307.8 g ± 30
- Work Done: 22.54 mJ ± 2.63
- Quantity of Fractures: 25 ± 4

Conclusion:

- Test results help determine the effects of different formulations on texture, ensuring consistency in production and quality control.
- These results are valuable for conducting shelf-life trials and predicting consumer perception of the product.