APPLICATION

Adaptation of AACC 74-10A compression test for evaluating freshness of sliced white loaf

OBJECTIVE

Measurement of bread firmness as an indication of freshness vs staling.

TEST PRINCIPLE:

Single slice of 25mm or two slices of 12.5mm in thickness are placed under a 38.1mm diameter cylindrical probe. Bread is compressed 3mm and peak load is used as an indication of freshness. In addition, sample may be compressed to a certain load. The distance travelled to achieve that load is compressibility, which is an indication of softness.

BACKGROUND

The original AACC method for bread compressibility specifies an apparatus known as the Baker Compressimeter, which quantifies the compressibility of a bread sample. The test is based on the theory that peak load increases and compressibility decreases as the bread ages.
This adapted method of bread compression not only provides valuable information relating to product staling, but also can provide an invaluable indication of textural differences arising from ingredient and formulation manipulation.

METHOD

Test sample is placed on table with side toward center of loaf facing up. Center sample under probe. During test compression load sensed by probe is continuously recorded via software.

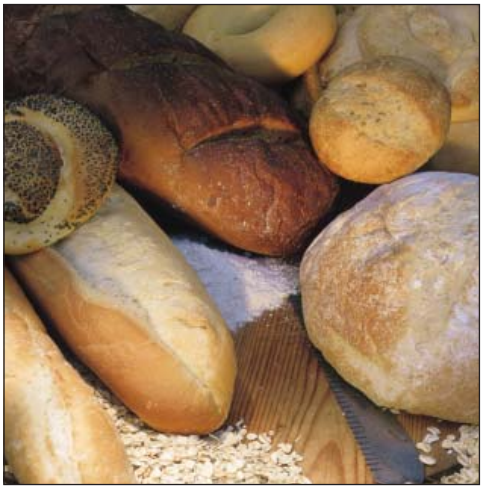


TABLE 1
LFRA Settings

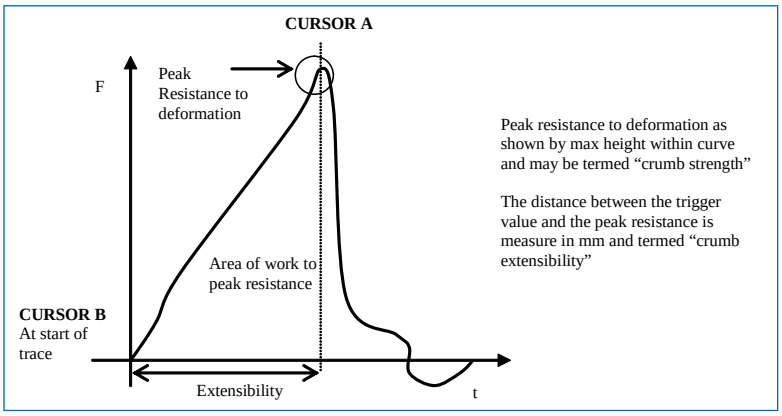
MODE:	Measure force in compression
PLOT:	Peak
SPEED:	1mm/sec
DISTANCE:	3mm
OPTION:	Normal
TRIGGER:	Auto 4g Trigger

PROBE:	38.1mm Ø Perspex cylinder (Ref: TA 4)

TEXTURE APPLICATION NOTE

BREAD

READING



PARAMETERS:

Crumb Strength: Peak resistance to deformation
Crumb Extensibility: Distance between trigger point and peak resistance
Crumb Work: Area between trigger point and peak resistance

RESULTS:

	DAY 1
Crumb Strength	483g
Crumb Extensibility	21.2mm
Crumb Work	4273.7gs

DISCUSSION

Observations from the trace give a good indication of bread quality. Results over a staling period have shown greatest and most significant difference between samples within crumb extensibility and area of work to peak deformation. Peak values for crumb strength were shown to illustrate some inconsistency, which may affect the significance of the test data attained. The test procedure determined elasticity and break characteristics of the samples evaluated as well as generating an indication crumb strength representative of product consistency.
Further work with breads of known formulation is recommended under controlled conditions to illustrate the potential for application of such tests within a quality or production environment.

EMPIRICAL FACTORS

Test conditions which will affect results generated:
1. Sample size
2. Sample age
3. Sample container and/or test probe employed
4. Sample positioning and centralisation

Sample conditions which will effect results generated:
1. Formulation and composition
2. Bake or process treatments
3. Sample storage and exposure

CONCLUSION

This method is very simple to follow and provides valuable data related to both the staling and compositional properties of bread. The method can therefore be incorporated within both quality and development programmes as a means of optimising product quality. In addition correlating data generated with perceived sensory characteristics extends the value of such tests further.

RELATED TESTS

TPA Type assessment of bread sample
Adaptation of AACC Method (74-09) for Bread Firmness
Stress relaxation as an indicator of bread staling

REFERENCES:
Dahle, L. and Sambucci, N. 1987. Application of Devised Universal Testing Machine Procedures for Measuring the Texture of Bread and Jam Filled Cookies. American Association of Cereal Chemists, Inc. 32, No. 7, 466-470.

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