APPLICATION

Comparison of product softness of full, medium and low fat soft cheese, using the 45° cone.

TEST OBJECTIVE

To determine the spreadability and softness of cheeses using the 45° cone probe.

BACKGROUND

Soft cheeses are cheeses with moisture contents between 48% and 80%. Full fat soft cheeses should not contain more than 60% moisture with a fat content greater than 20%. Texture analysis plays a vital role in the quantification of curd characteristics where it acts as a rheological predictor of finished product quality, as well as a potential indicator of moisture content. Stabilizer systems build solids, increase viscosity and enhance product mouthfeel (creamy texture) and flavour release. Texture analysis thus plays an essential role in the development of low fat foods where the product developer wishes to mimic the texture profile of full fat counterparts.

This test compared:
1. Full fat = 30% fat, with 8% protein
2. Light = 15% fat, with 12% protein
3. Extra light = 6% fat, with 15% protein

TEST CONFIGURATION

Samples were removed from refrigerator at 6.8 °C, located beneath the test probe and evaluated within original container. Three replicate tests were made within the same sample. Three minutes elapsed between the first and last test
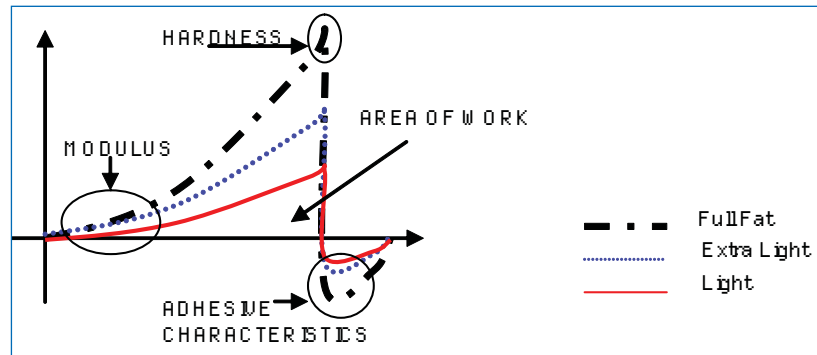

TABLE 1
LFRA Settings

MODE:	Measure force in compression
PLOT:	Peak
SPEED:	1 mm/s
DISTANCE:	20 mm
OPTION:	Normal
TRIGGER:	Auto 4 g

PROBE REF:	Ref: TA15 – 45° Perspex Cone

BROOKFIELD

TYPICAL RESULT

OBSERVATIONS

The force deformation curves of the three products show dramatic variation of textural characteristics. The full fat product is the most firmly set, possessing the greatest values for modulus, hardness, and adhesion. The half fat product had the lowest values of the three soft cheeses. The extra light sample exhibited characteristics between those of the other two materials.

PARAMETERS

HARDNESS (g)	Peak positive load attained in full cycle Force required to attain a given deformation
ADHESIVE FORCE (g)	Peak negative load attained in full cycle Force required to pull probe from sample
TOTAL POSITIVE AREA (gs)	Work required to attain deformation indicative of internal Strength of bonds within product
TOTAL NEGATIVE AREA (gs)	Work necessary to overcome attractive forces between food surface and materials with which it comes into contact
MODULUS (g/s)	Ratio of sample stress divided by strain during the first compression cycle e.g. the slope of force:deformation curve within linear region. It is representative of sample rigidity

RESULTS

	FULL FLAT	LIGHT	EXTRA LIGHT
HARDNESS (g)	897	180	356
ADHESIVE FORCE (g)	-140	-33	-60
TOTAL POSITIVE AREA (gs)	6502.8	1171.7	2279.4
TOTAL NEGATIVE AREA (gs)	196.8	-63.5	-83.9
MODULUS (g/s)	34.6	5.7	11.1

CONCLUSION

The full fat product has the firmest texture. The light product is very soft in comparison. The extra light product falls between both the full fat and light samples, with a structured consistency resulting from stabilization with increased milk protein and additives. The inclusion of these compounds failed to mimic the overall profile of the full fat sample.