Application manual No. 120

Production: SURIMI

Objective: Comparison of the cutting strength of two different types of surimi using a knife blade

Type of action: Cutting test

Test mode settings:

| Speed	Test mode	Trigger	Target	Hold
2 mm/s	Distance (c)	50 gf	10 mm	0 sec

Accessory:
Blade of Warner Bratzler, Platform

Sample Preparation:
The Slotted Insert is secured on the Heavy Duty Platform. The Knife Edge is attached to the load cell carrier and lowered into the slotted insert. The Heavy Duty Platform is repositioned so that there is no contact between the blade and slot surfaces and a 'blank' test run as a check. The blade is then raised to allow placement of the sample.

Test Set-Up:
Samples are removed from their place of storage just prior to testing. Samples may need to be cut to allow them to fit on the platform. For comparison purposes, sample dimensions should be noted and kept constant. The sample is then placed centrally under the Knife Edge.

Typical plots:
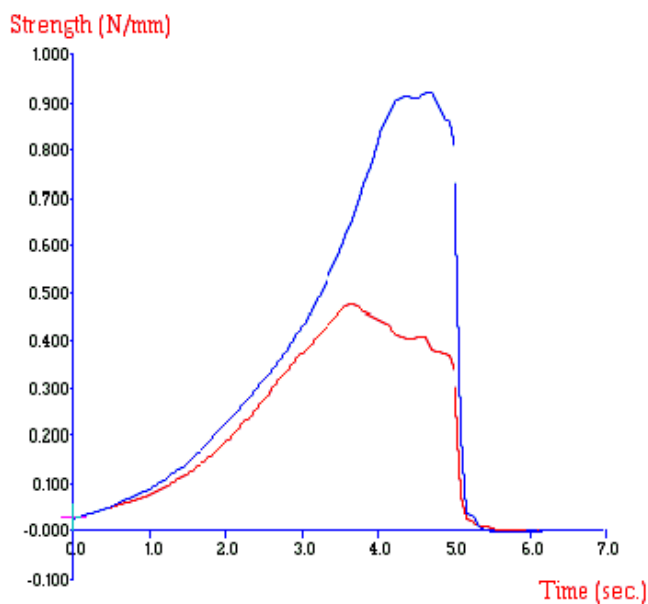
The above curve was produced from fresh and defrosted surimi (18x12x20mm), tested at 5C.

Observations:

The results show that the defrosted samples have a higher cutting strength than the fresh samples. When force is applied, the defrosted sample also ruptures at a greater distance ('distance at failure') and requires much more total work, implicating a greater resistance to cutting. The larger the distance to fail the more elastic (rubbery) is the sample. This would indicate that when placed between the front teeth, the defrosted samples would require a stronger 'bite' from the consumer.

Data Analysis:

☒Max Force

☒Peak Distance

Results

Sample	Mean Max. Strength 'Cutting Strength' (+/- S.D.) (N/mm)	Mean Distance at Failure (+/- S.D.) (mm)	Mean Area 'Work of Shear' (+/- S.D.) (N/mm·s)
Fresh	0.4 +/- 0.06	5.9 +/- 1.3	1.3 +/- 0.1
Defrosted	1.0 +/- 0.05	8.3 +/- 0.3	2.3 +/- 0.1

Notes:

- It is important that the sample is placed centrally under the blade, otherwise a false trigger may occur which will then be followed by the slip of the sample across the base plate into the central cavity, thus producing an incorrect force profile.

- The 'Cutting Strength' correlates to the 'Firmness' of the sample i.e. the greater the 'Cutting Strength', the 'Firmer' is the sample.

- When attempting to optimize test settings it is suggested that the first tests are performed on the hardest samples to anticipate the maximum testing range required and ensure that the force capacity allows testing of all future samples.