

QUALITY ASSESSMENT OF FISH JELLY PRODUCTS AND RAW MATERIAL USED FOR PRODUCTION OF FISH JELLY PRODUCTS

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INTRODUCTION

The quality of fish jelly products is assessed by measuring the gel strength objectively and organoleptically by folding and teeth-cutting tests. This quality depends on the following factors:-

1. Fish species
2. Condition of fish
3. Processing method and control
4. Moisture content of final product

The quality assessment would be useful for raw material suppliers and its users (eg. fishball processors) to know the quality of the raw material used for the production of fish jelly products; and to assess the quality of the final products.

I INSTRUMENT/APPARATUS AND MATERIAL

Sausage casing (\varnothing ca 2.5 cm)

Fudoh Rheometer (Model NRM-2002J)

Knife

Cutting board

Trays

Stainless steel moulds — i) \varnothing 2.5 cm, 2.4 cm thick for gel strength measurement.
ii) \varnothing 2.5 cm, 5 mm length for organoleptic assessment

II SAMPLE AND TEST PIECE PREPARATION

For raw material

1. Randomly collect 300 g raw material sample (eg minced meat, leached meat, surimi).
2. Put raw material sample into the mortar grinder.

3. The raw material sample is ground for 25 min as follows:-
 - i) grind the sample for 5 min to break up the muscle fibres.
 - ii) add 1.5% salt based on the weight of fish meat and grind for 5 min.
 - iii) add another 1.5% salt and grind for another 5 min.
 - iv) add water 30% gradually to the ground meat sample and continue to grind for 10 min with constant mixing.
4. Fill the ground fish paste into sausage casing taking care not to include air bubbles. This is done by pressing the meat paste onto a board before filling into the casing.
5. Set the sausage-like sample in water bath at 40°C for 20 min followed by heating at 90°C for 20 min.
6. After heating, cool the sample in iced water immediately to prevent further heating.
7. Immerse the sausage-like sample in running water till sample is at room temperature before measurement.
8. Cut the sample for gel strength measurement into 2.4 cm length, \varnothing 2.5 cm with the stainless steel moulds and place on a tray. Five test pieces will be measured for each sample. Slice 5 test pieces of 5 mm thickness \varnothing 2.5 cm for the organoleptic assessment.

For fish jelly products

1. Fish jelly products eg. fish balls, fish cakes, must have a height and thickness of ca 2.0-2.4 cm.
2. These products will be trimmed into standard size of 2.0-2.4 cm by 2.0-2.4 cm.
3. Prepare 5 test pieces for gel strength measurement.
4. Slice 5 test pieces of 5 mm thickness for organoleptic assessment.

III MEASUREMENT AND ASSESSMENT

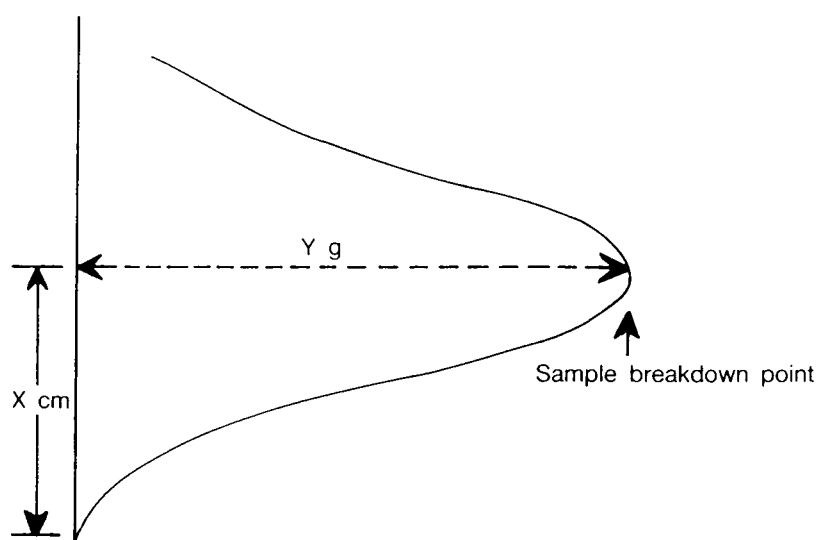
A. GEL STRENGTH MEASUREMENT BY FUDOH RHEOMETER

1. Set the following parameters on the Fudoh rheometer and chart recorder:-

	Rheometer	Chart Recorder	Factor
Speed (cm/min)	6	12	(x 1/2)
Sensitivity (volts)	1	1/2	(x 1/2)

- Place a test piece on the sample holder and switch ON the Fudoh rheometer and chart recorder simultaneously.
- When test piece is broken as indicated in the recorder chart, switch OFF the chart recorder and rheometer.
- Repeat with all the test pieces to obtain the average results.

CALCULATION



Recorder Chart

$$\text{Gel strength} = X \times Y \times F \quad \text{g.cm}$$

$$\text{where } F, \text{ factor} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

Fish jelly products of acceptable grade have a gel-strength of 200-300 g.cm.

B. ORGANOLEPTIC ASSESSMENT BY FOLDING AND TEETH-CUTTING TESTS

Organoleptic tests provide a convenient and quick assessment of the "springiness" of final products. Although the tests should be performed by trained personnel, the training is well worth the effort.

(a) Folding Test

Five slices of 5 mm thickness are taken from the prepared samples. Each is then folded in half and if there is no tear or breakage, further folded into quarter. The grading is as follow:-

<u>Condition of test samples when folded</u>	<u>Grade</u>
• No breakage in any of five samples when folded in quarter	AA
• Slight tear in any one of five samples when folded in quarter	A
• Slight tear in any one of five samples when folded in half	B
• Breakage (but pieces still connected) when folded in half	C
• Breaks completely into 2 pieces when folded in half	D

Commercial products of acceptable grade should have a rating of AA.

(b) Teeth-Cutting Test

Samples similar to that for folding test are used to assess the "springiness" using the teeth-cutting test. The grading gives subjective assessment of the resistance experienced by a trained panel when the test piece is bitten between the upper and lower front teeth.

<u>Score</u>	<u>Grade</u>
10	Extremely strong springiness.
9	Very strong springiness
8	Strong springiness
7	Quite strong springiness
6	Acceptable springiness
5	Acceptable, slight springiness
4	Weak springiness
3	Quite weak springiness
2	Very weak springiness
1	Mushy texture, no springiness

Local products usually fall in the range of score 5-6.

REFERENCE

Instruction and operational manual: Fudoh rheometer
Fudoh Kogyo Co. Ltd. Available in MFRD laboratory.