Production: LASAGNE

Objective: Assessment of the tensile strength and extensibility of three types of cooked lasagne

Type of action: Tension test

Test mode settings:

Speed	Test mode	Trigger	Target	Hold
3 mm/s	Distance (t)	5 gf	40 mm	0 sec

Accessory:
Noodle stretching rig

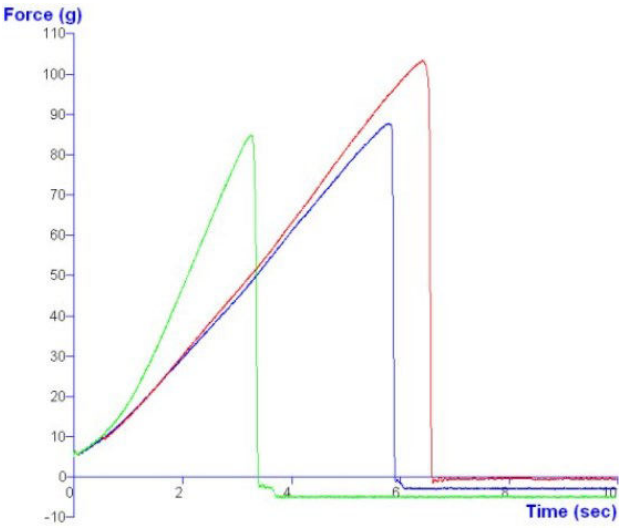
Sample Preparation:
Prepare annular samples from each type of pasta sheet using the cutter punch and supplied PTFE board. Load the sample with the waist section in the middle of the test region and commence the tensile test.

Test Set-Up:
To convert the Spaghetti/Noodle Tensile Rig for use with the Noodle/Pasta Loop Adapters, use an Allen key to remove the black spaghetti/noodle strand clamps from the upper and lower arms. Push one red split washer into the arm, followed by a black mounting washer and finally another red split washer. Repeat for the other fixture arm.

The upper arm of the Noodle/Pasta Loop Tensile Rig is located into the load cell and locked into position. The lower arm of the fixture is positioned on the base of the instrument and the screws are loosely tightened. The instrument arm is moved down so that the upper arm of the tensile rig is close to the lower arm (approximately 2-3 mm). The fixture is re-positioned and the screws tightened to securely fasten the fixture to the instrument base.

Probe Calibration:
Go to **Calibrate Height** and set return distance to 5 mm, the return speed to 20 mm/s and the contact force to 50 g.

Typical plots:



Typical Texture Plots of three types of lasagne

Observations:
The test begins with the upper arm moving away from lower arm at the pre-test speed of 1 mm/sec. As the pasta loop is extended the force increases and when the force equals the trigger force of 5 g the speed increases to 3 mm/s and data is recorded. The sample is extended and the force continues to increase until the sample can no longer support the applied force and the sample breaks. In order to have a valid test result the sample should break in one of the two waist sections in the middle of the gauge length. The upper arm will continue to move to the target distance of 40 mm and then return to the start position at the post test speed of 10 mm/s.

Data Analysis:
☒Max Force

Results

Sample	Tensile Strength +/- S.D. (g)	Extensibility +/- S.D. (CoV) (mm)
Durum Wheat Lasagne	87.87 +/- 11.65	9.17 +/- 2.04 (22.2%)
Egg Lasagne	85.90 +/- 7.16	17.98 +/- 2.62 (14.6%)
Spinach Lasagne	104.3 +/- 11.03	20.08 +/- 3.77 (18.8%)

Notes:

- The method used in this report could be extended to other sheet pasta or noodle products. An alternative cutter may be required for thicker dough samples and consequently a higher capacity load cell may be required to fracture larger cross-sectional area samples.