Production: RICE PUDDING

Objective: Comparison of the firmness of the rice grains in two types of rice puddings

Type of action: Compression test

Test mode settings:

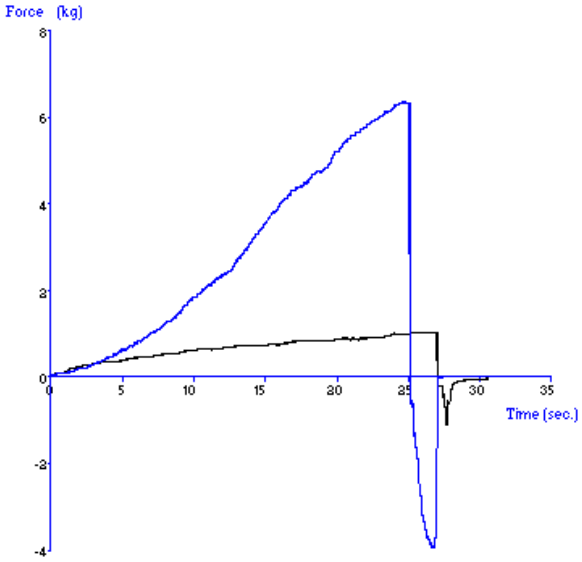
Speed	Test mode	Trigger	Target	Hold
1 mm/s	Strain (c)	30 gf	65 %	0 sec

Accessory:
ϕ 40 mm cylinder probe, Platform

Sample Preparation:
Separate the rice grains from the milk phase to ensure that the same mass of rice grains is being analyzed in each test. This can be achieved by washing the rice pudding in a sieve and then draining as thoroughly as possible.

Test Set-Up:
Tests are carried out either in a standard size back extrusion container (50mm diameter) or in the original rice pudding container* (with a similar or larger diameter). Just prior to testing, remove the sample from place of storage e.g. refrigerator (5C) and weigh out a constant mass. It is important that this weighed amount is enough to fill the container by approximately 75% of its capacity e.g. 60g. If there are any large spaces between rice grains these should be removed by rearranging the rice grains. This should produce an evenly packed sample, ensuring that there is a flat test surface to avoid early triggering of the test. Position the sample centrally under the cylinder probe. Commence the test. When the probe is returning to the start (i.e. pulling out of the sample) it is recommended that the sample container is held to avoid it being lifted up.

Typical plots:



The above curves were produced from chilled and canned rice pudding samples carried out in a 75% full standard sized back extrusion container, tested at 20C.

Observations:
When a 30g surface trigger is attained (i.e. the point at which the lower surface of the cylinder probe is in full contact with the product) the probe proceeds to penetrate to a depth of 65% strain (*or other specified percentage). At this point, the probe returns to its original position. The maximum positive force is taken as a measurement of firmness - the higher the value the firmer is the sample. The maximum negative force can be taken as a measurement of stickiness.

Data Analysis:

Results

Sample	Mean Maximum +ve Force ('Firmness ') (+/- S.D.) (kg)
Canned	1.05 +/- 0.09
Chilled	6.29 +/- 0.15

Notes:

- Depending on the regularity of the surface (i.e. the contents of the container may not have settled as a flat surface), it may be necessary to increase the trigger force value slightly. This ensures that the test starts collecting data once there is full contact between the probe and product.
- When comparing different samples ensure that the temperature, container size and the mass of the product dispensed are the same (and should always be specified) when reporting results.
- The % strain of penetration to be set in the test mode setting will depend upon the depth of the sample within the container, the depth of the container, and whether the chosen container is tapered towards the base or not. The chosen depth should not exceed 75% of the depth of the sample so that cylinder probe does not come into contact with (or indeed approach very close to) the base during testing which could produce an erroneous result.
- For the comparison of 'stickiness' the probe must return to the same position above the sample after each test. To do this it is necessary to calibrate the probe to a set start distance e.g. 70mm above the bottom of the sample container.
- During penetration of the cylinder, a large blip in the otherwise smooth curve may be observed. This is due to the compression of a large air pocket within the sample. Care should be taken when dispensing the product into containers to avoid the formation of large air pockets.
- 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.