Production: DIPS (Taramasalata, Houmous, and Tzatziki)

Objective: Comparison of penetration forces and consistency of 3 types of dips using a cylinder probe

Type of action: Penetration test

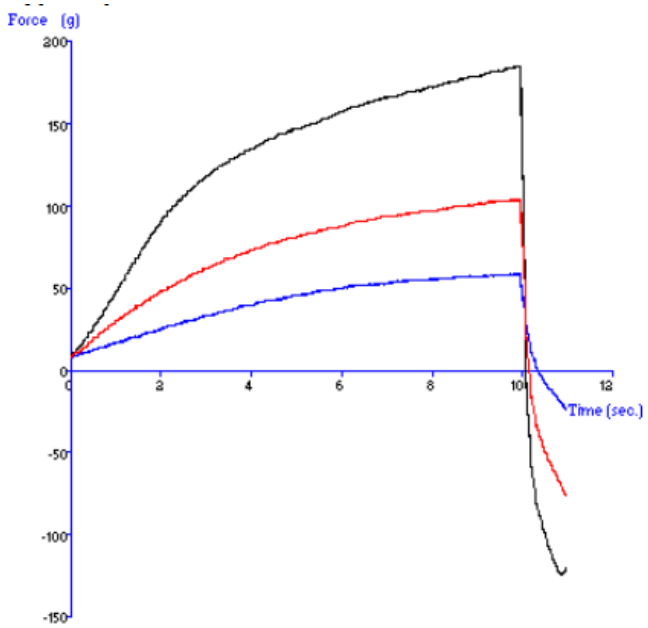
Test mode settings:

Speed	Test mode	Trigger	Target	Hold
1 mm/s	Distance (c)	5 gf	10 mm	0 sec

Accessory:
ϕ 25 mm cylinder probe Aluminum, Platform

Test Set-Up:
Remove the dips from place of storage and position a dip pot directly under the line of penetration of the probe. Commence the test immediately. Penetrate into each pot only once.

Typical plots:



The above curves were produced from samples tested in containers with a diameter of 100mm and a depth of 50mm. The samples were tested immediately on removal from the refrigerator (5.0C).

Observations:
Force is seen to gradually increase as penetration depth increases in each case. The houmous dip however appears to require a considerably higher force to penetrate to the specified depth compared to the tzatziki dip which produces more than a 50% lower peak force. The area under the houmous curve is also the greatest, which suggests that it be of the thickest consistency. This is expected, as a product that is firmer would normally be thicker.

Data Analysis:
☒Max Force

Results

Dip Type	Mean Max. Force 'Firmness' (+/- S.D.) (g)	Mean Area 'Consistency' (+/- S.D.) (g·s)
Taramasalata	100.2 +/- 3.3	685.7 +/- 17.5
Houmous	181.2 +/- 3 .2	1258.1 +/- 1.4
Tzatziki	61.9 +/- 6.3	405.5 +/- 41.8

Notes:

- When testing products of a thin consistency one may find that the resulting forces are very low. In such cases a larger cylinder probe is recommended. This will prove to magnify the resulting forces due to an increase in the probe: product contact area and is likely to be more successful for sample differentiation.
- The product may be tested directly from the container in which it was originally dispensed. However, when comparing different samples one should try to ensure that the temperature, container size and the volume of the product dispensed are the same (and should always be specified) when reporting results.
- The distance of penetration to be set in the test mode settings 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 be such that cylinder probe does not come into contact (or indeed approach very close) to either the walls or the base during testing which could produce an erroneous result.
- During penetration of the cylinder, a large blip in the otherwise smooth curve may be observed. This is due to the compression of an air pocket or particulate within the product.
- The two parameters that have been measured i.e. the area under the curve and the maximum force have here been expressed as '*Firmness*' and '*Consistency*' and have been shown to be discriminatory between different samples. In most cases these parameters will rank different samples in the same order and therefore these parameters may be a measurement of the same property. Sensory evaluation tests may confirm this point.
- If the dip is of a flowing consistency, a backward extrusion test may be an alternative to the penetration test suggested above.
- When testing products of a thin consistency one may find that the resulting forces are very low. In such cases a larger cylinder probe is recommended. This will prove to magnify the resulting forces due to an increase in the probe: product contact area and is likely to be more successful for sample differentiation.