Mastication and Swallowing Measurement While Eating Gel and Sol Samples

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Summary

The palatal pressure while eating gelation, agar and carrageenan gel samples was measured by three transducers embedded in an artificial palate installed in the human mouth. Mastication with the tongue and plate shifted to mastication with the teeth at a palatal pressure of around 40-50 kPa for each subject. This critical pressure differed between subjects. The first palatal pressure pulse for the three gels was compared with stress-strain curves measured by compression machine with a compression rate of 10 mm/s. The breaking stress for each gel obtained by the palatal pressure measurement almost agreed with that of the machine measurement. However, a single-break patter was shown on the stress-strain curve from mechanical measurements, while a multi-break patter was observed for the palatal pressure measurement.

Velocity through the pharynx of swallowed rice boiled with different water contents was measured by ultrasonic Doppler shift. The average vertical component of the velocity was ascertained to be around 0.1m/s for swallowed rice, for below 85% added water. He average increased gradually with increase of added water to 0.15m/s for pure water. The maximum vertical component of the velocity of swallowed water was more than three times faster and more dispersed compared with that of rice 85% added water.