

A simple theory helps identifying which different rheological properties can result in the same syringe flow test performance of the International Dysphagia Diet Standardisation initiative (IDDSI)

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Texture modified food and beverages allows the care of patients with swallowing disorders. Ideally, the rheological behavior of such food products should be evaluated, to avoid aspiration and the risks of choking, while keeping as much as possible the pleasure to eat.

This study consider the syringe flow test, recommended by the International Dysphagia Diet Standardisation Initiative (IDDSI), for texture modified drinks, to better understand the relationship between rheology and the IDDSI's texture classification. We established a simple theory allowing to predict the IDDSI texture level from the beverage's rheology.

A rheometer with a Couette shear cell were used to characterize the shear rheology of Newtonian fluids with a range of shear viscosities from 0.04 to 1.31 [Pa.s], as well as different shear thinning solutions.

The theory was validated against the flow measured experimentally in different syringe geometries. Besides quantifying the final residue in the syringe, the analysis of the IDDSI test dynamics was completed using video recording, image analysis and a computer linked balance.

The simple theory presented in this study shows a good agreement with the experiments.

The theory is in turn used to identify, which different rheological properties can result in the same IDDSI syringe flow test performance. The boundaries between "IDDSI-similar" Newtonian liquids and shear thinning liquids with different flow indices are presented.

These results could be used to design drink flow properties to reach a desired IDDSI syringe flow test performance. They could also orient future clinical trials aiming at further verifying the relevance of the IDDSI syringe flow test with respect to in vivo flow during swallowing, or identifying potential areas of improvement.