

# Brain-break! Can instruments do the job?

## Sensory-rheology correlation in the context of swallowing function

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### OVERVIEW

- Historically, sensory measures were correlated with instrumental measurements to predict consumer acceptance of food.
- In recent years, this correlation has branched off to understand the swallowing function in the context of **dysphagia** management.



Dysphagia is the medical term for swallowing difficulty. It affects nearly 30 - 40% of the elderly<sup>1</sup>

### RESEARCH GAPS

A thorough piece of work correlating sensory and instrumental measurements has not yet been performed for a range of dysphagia food.

### OBJECTIVES

To determine how sensory data and rheological measurements link in dysphagia-oriented meals

Hypothesis - There is a predictive relationship between sensory and rheological properties

### MATERIALS AND METHOD

#### 1) Sensory studies

Three groups of participants were selected

- Healthy young (n=10)
- Healthy older (n=10)
- Dysphagic (n=10, pending)

#### 3) Correlational studies

Yield stress, G' at LVR, Damping factor

Viscosity, Flow behaviour index, Consistency index

Small deformation test

Large deformation tests

Rheological tests that can imitate dynamic oral behaviour<sup>5</sup>

#### 2) Rheological studies

Rheological tests were performed on the same samples used for the sensory evaluation.



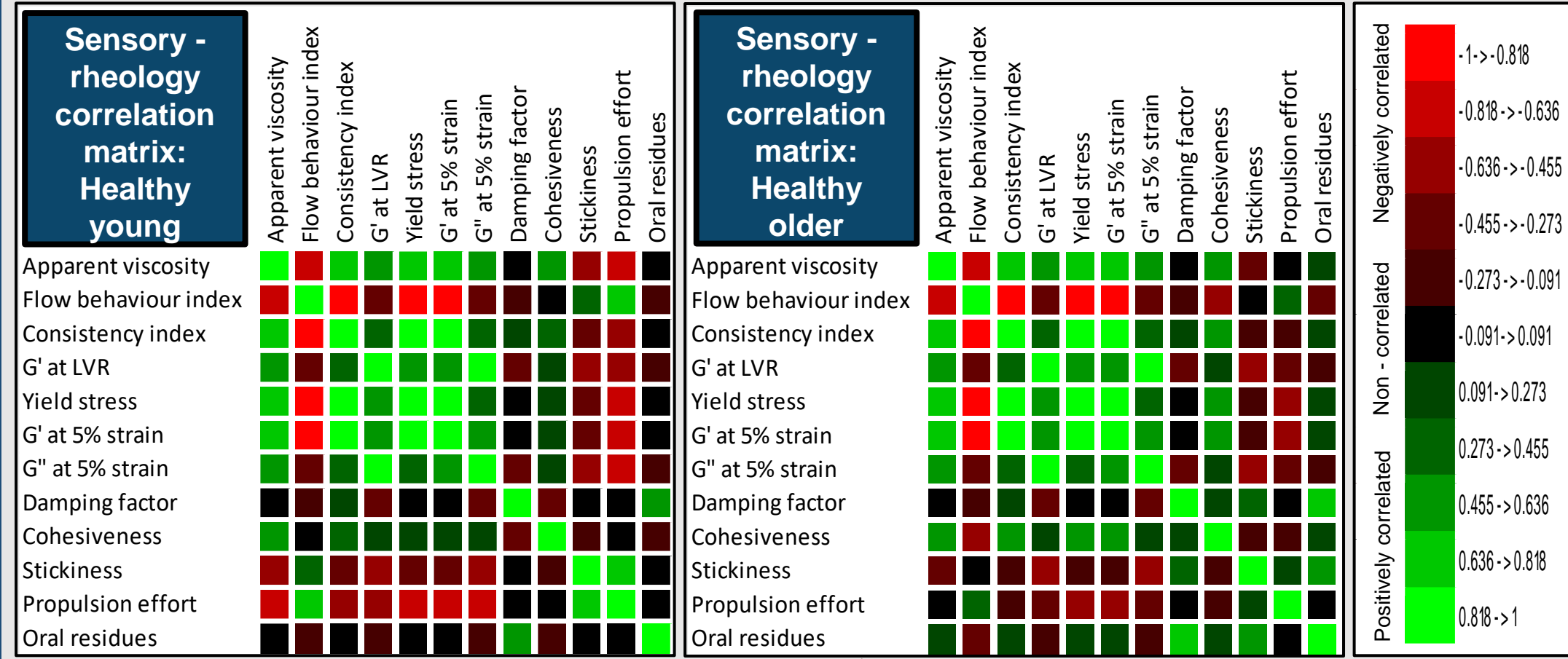
Each participant quantified 4 sensory attributes in 20 products on a 0-10 sliding scale.

- Cohesiveness
- Stickiness
- Propulsion effort
- Oral residues
- IDDSI Level 4 scooped purees
- IDDSI Level 4 shaped purees



IDDSI - International Dysphagia diet standardisation Initiative

### RESULTS AND DISCUSSION



The texture is the key when designing dysphagia meals.

Sensory analysis - Gold standard for determining food texture.

#### Then Why Instruments?

- Cost less
- Relatively quick
- Give numbers
- Reproducible results
- Potential for setting universal standards

Why rheology? If you can't make the food deform & flow, you can't swallow it!

Rheometry measures in what manner materials flow, deform, and fracture.

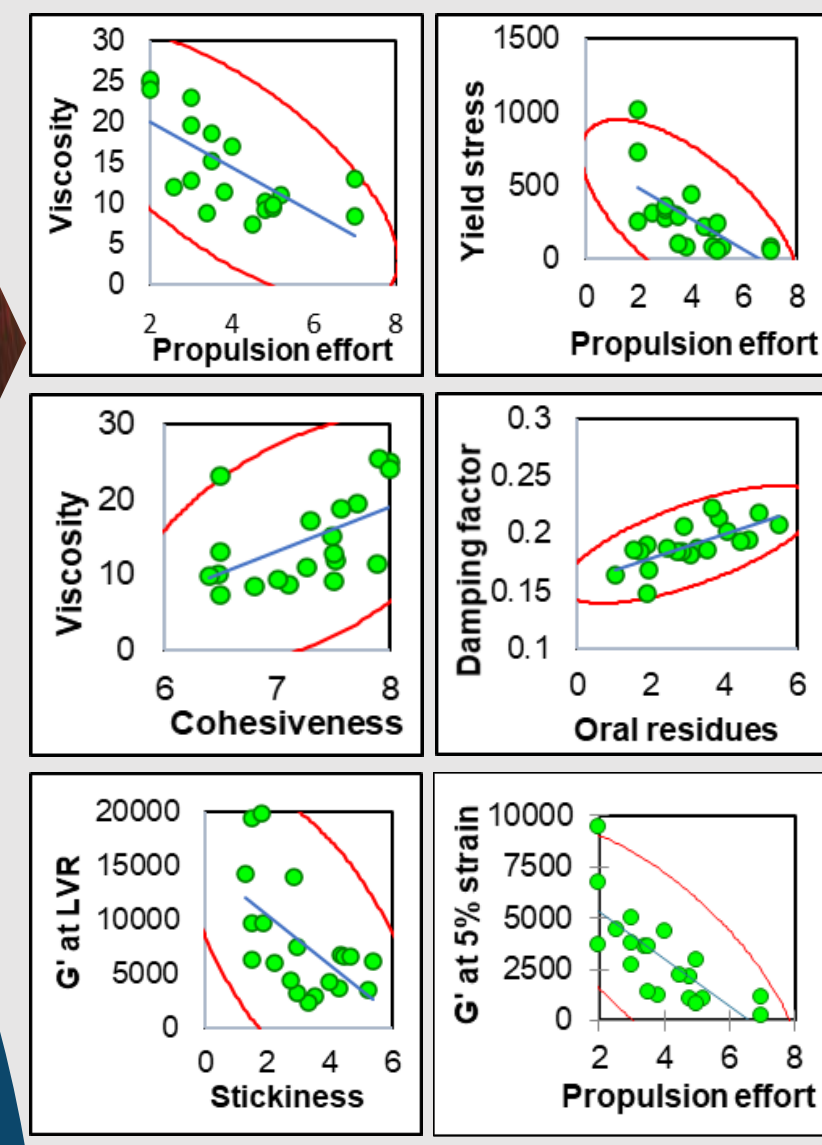
These occurrences have significant influence on textural sensations.

Rheometry provide quantitative information about these occurrences<sup>5</sup>.

Hence provides a better insight into food texture.



Well correlated sensory & rheological properties



A significant correlation was found between several sensory and rheological parameters.

### CONCLUSIONS

Multiple rheological measurements obtained

Reflect the sensory-texture performance of different dysphagia meals.

Thus, they provide guidelines to forecast if products have the desired safe swallow textural properties without performing a sensory test.

- Assist during
- Product development
  - Therapeutic intervention
  - Day-to-day testing

### FUTURE STUDIES

Assessment of texture through dysphagics has to be the standard against which instrument readings are calibrated. Therefore, the sensory evaluation will be continued with Dysphagic participants to determine if there is a significant difference in sensory-texture perception compared to healthy humans.

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