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## ► To cite this version:

Yurixy Bugarin Castillo, Pascale Bou Fadel, Anne Saint-Eve, Vincent Mathieu, Marco Ramaioli. Leveraging on the Extensional Properties of Flaxseed Extracts for the Design of Foods Addressing Swallowing Disorders. 37th EFFoST International Conference, 2023, Valencia, Spain. hal-04523319

**HAL Id: hal-04523319**

**<https://hal.science/hal-04523319>**

Submitted on 27 Mar 2024

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# LEVERAGING ON THE EXTENSIONAL PROPERTIES OF FLAXSEED EXTRACTS FOR THE DESIGN OF FOODS ADDRESSING SWALLOWING DISORDERS

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## CONTEXT

- 21.5% of the world population is expected to be over 60 years old by 2050<sup>1</sup>.
- Age-related physiological changes can induce swallowing disorders and strongly impact the quality of life<sup>2</sup>.
- Texture adaptations should ensure safe swallowing but also maintain pleasure during consumption<sup>3</sup>.

## OBJECTIVES

- ✓ To evaluate the *in vitro* and *in vivo* performance of flaxseed extracts as texture and elasticity enhancer to potentially improve palatability in designing tailored food textures for dysphagic patients.

## MATERIALS & METHODS

### Materials

Greek yogurt was diluted using water and flaxseed extracts at 1% dry matter. In this study, four drinkable yogurts (dilutions) are evaluated; two with and two without flaxseed extracts

Control\_GY

DY20%FL

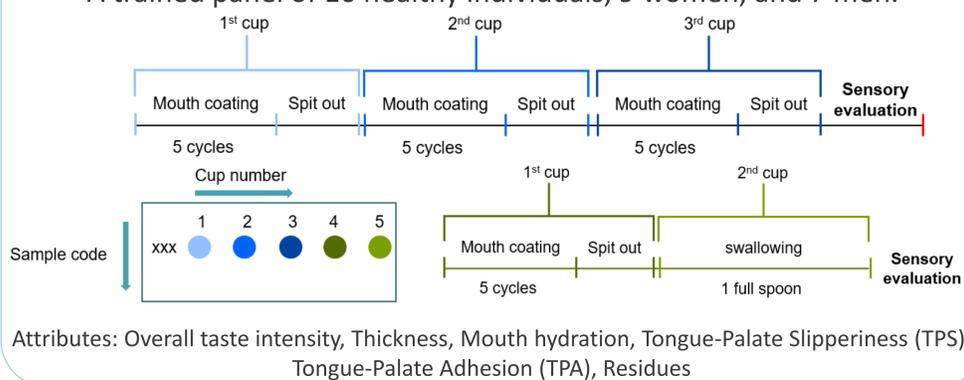
DY30%FL

DY20%W

DY30%W

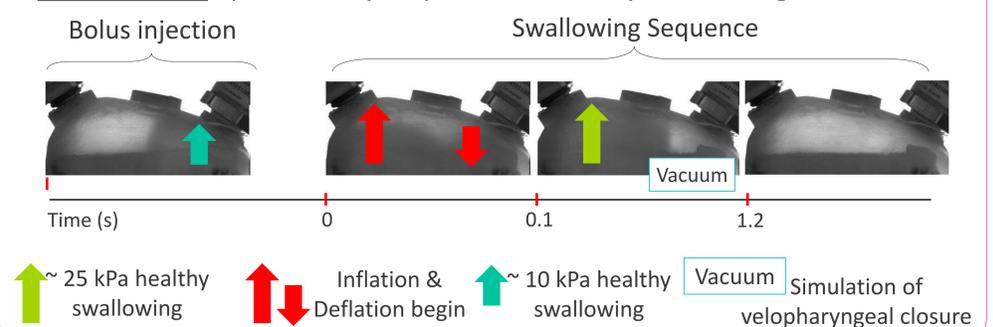
### Sensory Study

A trained panel of 16 healthy individuals, 9 women, and 7 men.

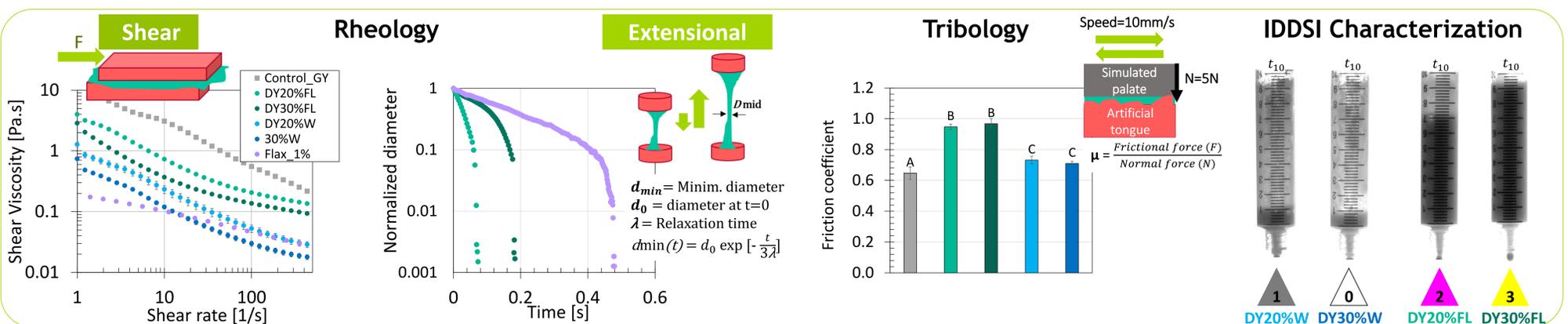


### Soft Robotic *In-Vitro* Setup

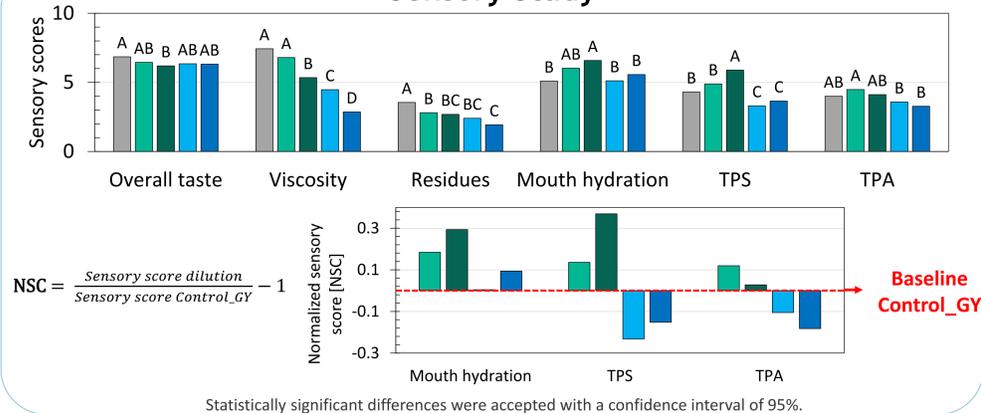
Soft robotics a preliminary step to foster safety swallowing assessment



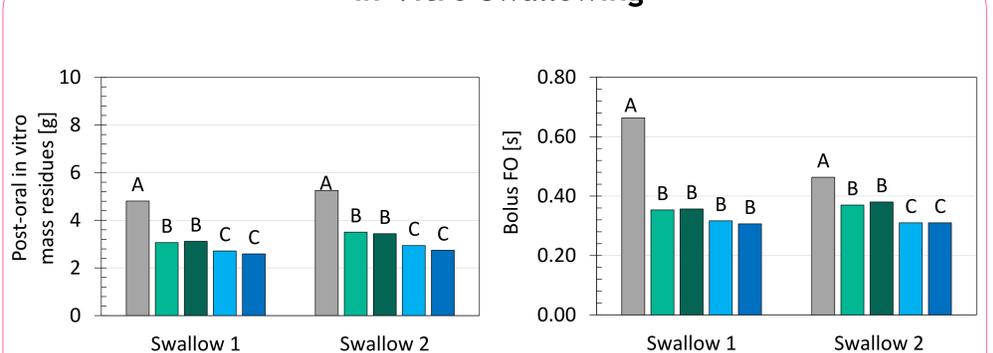
## RESULTS



### Sensory Study



### *In-Vitro* Swallowing



## CONCLUSIONS & FUTURE WORK

- ✓ Drinkable yogurt with flaxseed extracts enhanced sensory perceptions (mouth hydration and slipperiness), introduced elasticity, and improved bolus cohesiveness compared to drinkable yogurt without.
- ✓ Flaxseed extracts are a potential food ingredient to develop palatable products for patients suffering from swallowing disorders.
- ✓ For future development, instrumental characterization and *in vitro* performances could be valuable tools to evaluate and design personalized food.

## CONTACT

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## REFERENCES

1. United Nations. (2015). World Population Prospects. 2. Schwartz et al. (2018) Innovative Food Science & Emerging Technologies, 46, 91–106. 3. Rofes et al. (2011) Gastroenterology Research and Practice, 2011, 1–13.