Bioaccessibility of fish oil encapsulated by spray-drying: Influence of encapsulating agents and emulsifiers.

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Introduction

Omega-3:
- ✓ **Beneficial** effects for human **health**
- × **Poor solubility,** highly prone to **oxidation**
- × **Low income** from the diet

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Microencapsulation: most common approach to produce delivery systems for omega-3 rich fish oils

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Great interest in evaluating its impact on PUFAs **bioaccessibility**

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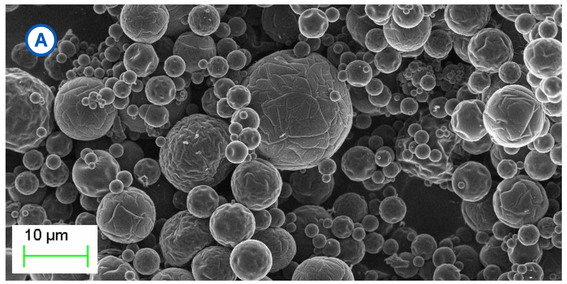
Aim of the study**: to evaluate the effect on the omega-3 bioaccessibility of**
- ❑ Emulsifiers: Whey Protein Concentrate Hydrolysate (WPCH) or Tween 20 (TW20)
- ❑ Encapsulating agents: Glucose syrup (GS) or Maltodextrin (MD21)

Methods

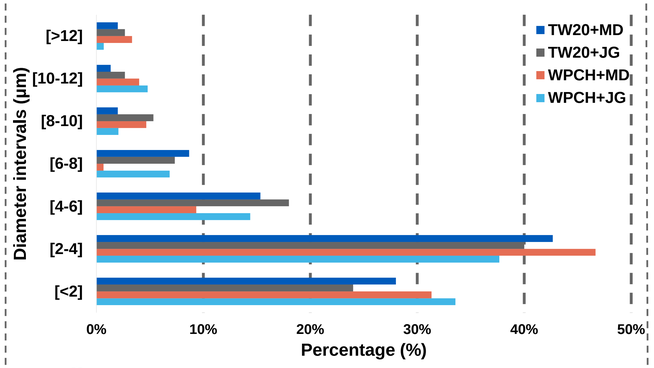
Microcapsules:
- ➢**Production:** spray-drying.
- ➢**Physical characterization:** surface oil, humidity, SEM.

Bioaccessibility:
- ➢**Digestion:** INFOGEST + pH-Stat method
- ➢**Physical characterization:** droplet size, ζ-potential, confocal microscopy.

Results

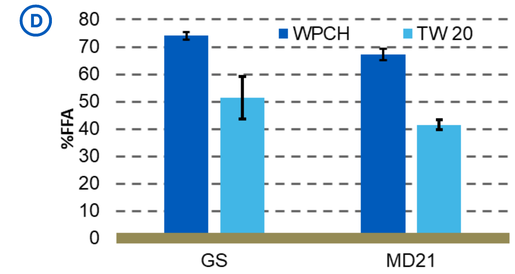


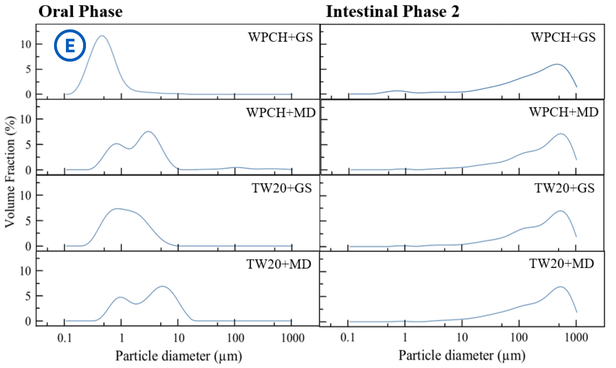
B Microcapsules size distribution

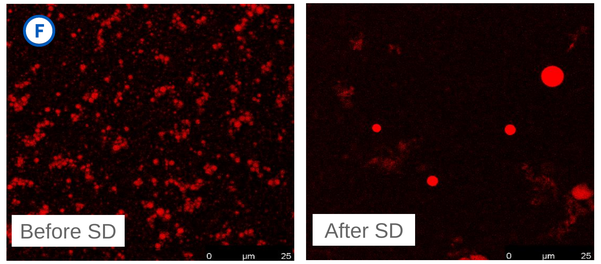


C

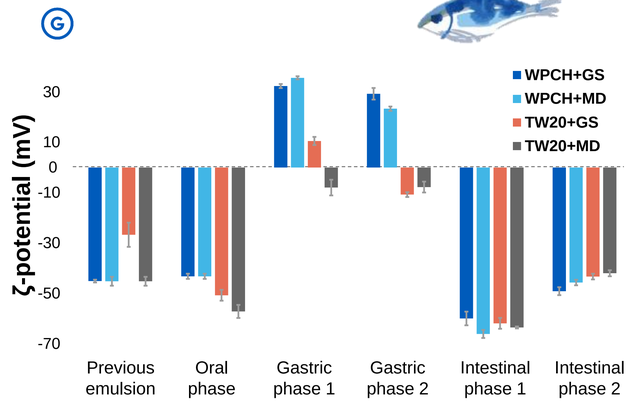
Surface oil %			
WPCH+GS	4.4 ± 0.1	TW20+GS	10.5 ± 0.6
WPCH+MD	4.7 ± 0.1	TW20+MD	10.3 ± 0.2







SD: Simulated Digestion



Conclusions

This study:

- ✓ Confirmed the **importance** of the **encapsulating agent and the emulsifier chosen**.
- ✓ **Emulsifier:** WPCH improved bioaccessibility compared to TW20
- ✓ **Encapsulating agent:** GS slightly improved bioaccessibility compared to MD21

Acknowledgements

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