

TAL 797 – Seminário

05/10/2022

Applicability of plant proteins as surfactants in food nanoemulsions

Graduate student: Irene Andressa

Advisor: Ana Clarissa dos Santos Pires (Food Technology Department)

Nanoemulsions are thermodynamically stable systems in which the dispersed and continuous phases meet in a liquid physical state. Nanoemulsions are very versatile and are used in the food industry to improve the dispersion, stability and bioavailability of bioactive compounds, for probiotics, additives, active agents in packaging and water treatment. On the other hand, to form nanoemulsions, the incorporation of surfactants is necessary to reduce the interfacial tension and, consequently, the Gibbs free energy of the system, providing kinetic and thermodynamic stability to the system. Thus, the interest in using natural surfactants in the food has increased due to the demand for a clean label. Proteins, mainly those from animal origin, can be used as surfactants in nanoemulsions due to their amphiphilic properties. However, with the significant increase in the demand for plant-based products, it is needed to study and use vegetable proteins, which in addition to presenting interesting emulsifying properties, are of low cost, easy and promising origin for incorporation into nanoemulsions.

References

- ASWATHANARAYAN, J. B.; VITTAL, R. R. Nanoemulsions and Their Potential Applications in Food Industry. **Frontiers in Sustainable Food Systems**, v. 3, n. November, p. 1–21, 2019.
- GRADZIELSKI, M. et al. Using Microemulsions: Formulation Based on Knowledge of Their Mesostructure. **Chemical Reviews**, v. 121, n. 10, p. 5671–5740, 2021.
- O’SULLIVAN, J. et al. The effect of ultrasound treatment on the structural, physical and emulsifying properties of animal and vegetable proteins. **Food Hydrocolloids**, v. 53, p. 141–154, 2016.
- TABILO-MUNIZAGA, G. et al. Physicochemical properties of high-pressure treated lentil protein-based nanoemulsions. **LWT - Food Science and Technology**, v. 101, n. November 2018, p. 590–598, 2019.

YERRAMILI, M.; LONGMORE, N.; GHOSH, S. Improved stabilization of nanoemulsions by partial replacement of sodium caseinate with pea protein isolate. **Food Hydrocolloids**, v. 64, p. 99–111, 2017.

AC Pires

Ana Clarissa dos Santos Pires
Professora Associada
Mat.: 10108-7 - DTA-UFV
Orientador

Irene Andressa
Orientado