

Crystallisation of Lipids at the Oil/Water Interface

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Crystallisation of lipids at the oil/water interface plays a significant role in the stability of emulsion systems [1, 2]. This is regardless of whether the emulsion is composed of lipids in the continuous or dispersed phase. Interfacial crystallisation is of particular interest for dairy products, as emulsified lipids undergo crystallisation upon cooling during production and storage. Lipid crystals also play an important role in the structure and texture of dairy products. Despite the influence of crystals at the oil/water interface on emulsions systems, factors influencing crystal interfacial activity are not well understood.

The work to be presented has the aim of understanding the effect of thermal cycling, ionic strength, and the type of surface active molecules on interfacial activity and structure of lipid crystals at the oil/water interface. The oil and aqueous phases were chosen in order to mimic a model dairy system. Profile analysis tensiometry (PAT) has been used, as the technique allows for the monitoring of the kinetics of interfacial tension in response to temperature changes. The temperature at which interfacially active lipid crystals are formed has been determined from those experiments. It can be concluded that both the addition of surfactant and the surfactant type alter the interfacial tension profiles for heating and cooling cycles compared to the pure system. Synchrotron small angle X-ray scattering was conducted on emulsion systems to study the formation, growth and structure of lipid crystals, following a temperature cycling regime similar to that conducted with PAT.

References

1. Douaire, M., et al., Fat crystallisation at oil–water interfaces. *Advances in colloid and interface science*, 2014. 203: p. 1-10.
2. Rousseau, D., Fat crystals and emulsion stability—a review. *Food Research International*, 2000. 33(1): p. 3-14.

Level of Expertise

Student

Do you wish to take part in the poster slam

No

Travel Funding

Yes

Speakers Gender

Female

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