**Flow and reconstitution properties of maize germ oleosomes emulsion stabilized with sodium caseinate**

A Matsakidou and V Kiosseoglou

*Laboratory of Food Chemistry and Technology, School of Chemistry, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece*

Oleosomes are natural organelles found in organisms, that contain triacylglycerols surrounded by a composite membrane constituted by proteins and phospholipids1. High-yield extraction processes can be employed to extract oleosomes from the raw material to exploit them in designing food or cosmetic products2. However, the large volumes of the obtained rich-in-oleosomes emulsion and the proven instability issues of the concentrated oleosomes emulsions and creams may narrow the potential applications in the industry. Oleosomes in the form of a dry powder would be a more convenient way of inserting oleosomes into different matrices and enabling longer self-life. For this purpose, oleosomes recovered from maize germ material, a side-stream product of the agrifood industry, were dried with the aid of the Buchi Nano-Spray Dryer B90 (NANO) or by mild thermal dehydration (THERM) followed by comminution to obtain rich-in-lipid powders3.

For stabilizing and preserving the oleosomes through the drying procedure, the effect of lecithin, sodium caseinate, and Tween 80 on oleosome size distribution in the recovered cream was preliminarily evaluated. Sodium caseinate (5% w/w)4 was found not only to disrupt oleosome coagulates in a 5% w/w in oil emulsion, compared to the oleosome cream, but also to be very effective in preserving the size of the droplets after thermal treatment. Therefore, a system of sodium caseinate-oleosomes was selected to be dehydrated. The method of dehydration that was employed had a high impact on the bulk and tapped density of the powders, classifying NANO as very poor and THERM as poor regarding their flowability. THERM powder exhibited very satisfying reconstitution properties regardless of the applied water temperature. The very small particle size hindered the wetting ability of the NANO powder and blocked its efficient reconstitution. Microscopic analysis of the reconstituted oleosomes dispersions revealed that in both samples limited oleosomes coagulation or coalescence took place after drying and powder reconstitution.

*References:*

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