DETERMINATION OF STABILITY IN LYOPHILIZED SALAD DRESSINGS BY DIGITAL IMAGE PROCESSING

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Digital image processing (DIP) is a powerful tool that can be used to describe the loss of emulsion stability by molecular diffusion or coalescence. The stability of salad dressings (lemon juice and extra virgin olive oil) microencapsulated with biopolymers (without sorbitol) was analyzed by fluorescence DIP for a 110 days period. The emulsions were stored both refrigerated (4ºC) and at room temperature (27ºC). In addition, sorbitol was added to a formulation stored under refrigeration and was monitored for 21 days. About 100 images were processed and more than 5.000 objects were counted in each analysis. Throughout the experiment time about 99% of the samples presented were roundness, ensuring that the objects accounted by DIP were, in fact, micelles. The average diameter of the fresh emulsions (EP) was higher than the reconstituted lyophilized emulsions (RLE). Moreover the RLE maintained at room temperature presented an average diameter larger than the samples stored at 4ºC throughout the 110 days. In fact, whereas approximately 45-65% of the micelles of the emulsion stored at room temperature presented a diameter between 0.1 and 1.0 μm, the emulsions kept at 4ºC presented higher percentages for this size range, indicating an increased stability of these samples. In both cases the majority of the micelles are in the sub-micron range. Furthermore, the DIP showed a greater stability for the refrigerated RLE with time throughout the experiment. Regarding the sorbitol influence, the emulsion containing sorbitol presented smaller micelles (in diameter) than without, considering both EP and RLE. During the studied period it was not possible to assure which destabilization (molecular diffusion or coalescence) process occurred.