EFFECT OF MICROFLUIDIZATION ON THE DISTRIBUTION OF ALPHA-TOCOPHEROL IN MICROCAPSULES OBTAINED BY SPRAY DRYING.

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Nano-particle encapsulation by spray drying was carried out by subjecting to spray drying sub-micron emulsions of maltodextrin and gum arabic prepared by using Microfluidization (0, 1 and 2 cycles). The encapsulation efficiency of alpha-tocopherol (A-T) as core material was investigated and attention was given to the distribution of surface A-T and encapsulated A-T in the powders. The distribution of A-T at two different loads of core material (17% (A) and 28% (B) were evaluated in the microcapsules by confocal laser scanning microscopy (CLSM). Results showed that the average drop size of the emulsion was significantly reduced by the homogenization process (from 1200nm to 350nm). Encapsulation efficiencies were between 56 and 90% and significant differences were observed between the powders homogenized (for 1 and 2 cycles) and not (0 cycle) (p< 0.05). The surface + encapsulated A-T varied with microfluidisation cycles in the A emulsion, while encapsulated A-T remained constant. In all cases, the encapsulation efficiency increased as the number of cycles increased. It was observed that the maximum encapsulation efficiency was dependant of the initial amount of A-T in the emulsion and will vary according to the microfluidization cycles used. Also a relationship, it was found that a larger number of cycles in the Microfluidizer decreased the size of the nanoemulsion at specific concentrations.