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IMPROVEMENT OF NUTRITIONAL BENEFITS IN FOODS BY INCORPORATION OF STARCH-ANTIOXIDANT ASSEMBLIES

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ABSTRACT This project was Financed in part by the regional program AISQAL. AISQAL (Integrated approach of food quality and safety) is a research program supported by the 2006 call for proposals of the *Région des Pays de la Loire*. Coordinated by Patricia Le Bail (inra-Nantes), this program proposes an effective integration of concerted research in the entire food chain to ensure the quality and the safety of foods. Phenolic acids have numerous health benefits; they represent a major stake for the research and the industry. Indeed, their use can constitute an attractive alternative to synthetic antioxidants that are less acceptable to the consumer. The main objective of this work is to preserve the phenolic acids nutritional interest in food emulsions. An innovative strategy has been developed to incorporate the phenolic acids in the emulsion with the aim of protecting their nutritional properties in the aqueous phase. A protective assembly made of hydrocolloids (using starch in particular) is in charge of embedding the antioxidant. This molecular encapsulation has been studied by X rays diffraction and differential scanning calorimetry to better understand the interaction and the location of the antioxidant in the assembly. Ageing tests have been carried out to assess the stability of the system. This work demonstrates the importance of the timely incorporation of protective compounds and of health benefit substances during the production of a food.

Keywords: Antioxidant, starch, molecular encapsulation, DSC, X ray diffraction