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Presentation Abstract

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Presentation Title:	Releasing ability of oregano essential oil from different entrapment systems
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Presentation Description/Abstract:	Micro/nanotechnologies are increasingly used in food industry to limit sensitive compounds from degradation/loss during processing/storage. Material and process conditions are important for microencapsulation success. Oregano, a Mediterranean food ingredient, has increasingly gained interest as a flavor and natural antioxidants source in its essential oil (EO) form. However, EO can suffer oxidation, chemical interactions or volatilization. This work aims to evaluate the releasing ability of entrapped oregano EO from microparticles of different hydrocolloids: starch spherules from native rice starch (with/without CMC and/or gelatin as binding agents), inulin and gelatin/sucrose mixtures. Entrapment was performed by spray- and/or freeze-drying at 15% OE incorporation level (w/w d.m.). Emulsions were prepared from different formulations and dried at different conditions. The release of EO was evaluated at 25 ºC by UV-VIS spectroscopy and diffusion coefficients (*D*) calculated. Depending on the nature of the polymer, EO *D* varied between 10^{-13} m^2/s (starch) and 10^{-16} m^2/s (inulin). For the rice starch system, although the size of spherical aggregates is strongly influenced by starch concentration, *D* was mainly influenced by gelatin as binding agent (Fig.1). Higher concentrations of gelatin lead to a faster release of OE. The gelatin/sucrose system, when spray-dried, revealed to be unsuitable for retention and later release of EO. The capsules were unstable and collapsed easily. *D* was around 10^{-15} m^2/s, depending on gelatin/sucrose ratio. When freeze-drying was applied the structure was efficient as encapsulating system. Microstructure from gelatin/sucrose (60:40) released higher amounts of EO. The *D* of EO from inulin capsules was only dependent on drying temperature (Fig.2). A decrease of diffusion coefficient was observed for samples dried above 140 ºC. This research provides important information on the effect of different hydrocolloids matrices on the release of oregano oil which are important

to optimize microencapsulation of functional food ingredients.