



## Book of Abstracts of the 1<sup>st</sup> Congress on Food Structure Design

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## Effect of digestion on solid lipid nanoparticles loaded with rosmarinic acid

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### Abstract

The incorporation of bioactive nanoparticles in food matrices as a way to improve and diversify functional and nutritional properties has been the aim of several research efforts. Solid lipid nanoparticles (SLNs) loaded with rosmarinic acid (RA) were produced using as lipid matrices the waxes Witepsol H15 and Carnauba (Campos et al., 2013). Since these nanoparticles will be further incorporated in food matrices, the effect of digestion on the stability and bioactivity of such systems was studied. Hence, nanoparticles were subject to simulated digestion conditions. Stomach was simulated by adjusting the pH of each solution to 2.0 (HCl, 1 M), and adding pepsin (25 mg/mL) at a ratio of 0.05 mL/mL of sample. Samples were incubated and digested during 60 min, at 37 °C, with continuous homogenization (130 rpm). Duodenum conditions were simulated by increasing pH of the digested samples to 6.0 (NaHCO<sub>3</sub>, 1M) and adding simulated intestinal juice comprising pancreatin (2 g/L) and bile salts (12 g/L) to a rate of 0.25 mL/mL of sample. All samples were incubated during 2 h, at 37 °C with continuous homogenization (45 rpm). Evolution of the physical properties was followed by Dynamic Light Scattering (DLS); polyphenol release % was obtained by High Performance Liquid Chromatography (HPLC). A release of 50% of RA from the SLNs was observed when SLNs were subjected to the duodenum phase. Concentration of free RA decreased along digestion simulation. Particle size was maintained along the simulation of digestion, viz. witepsol SLNs with sizes of ca. 220 nm and carnauba wax

SLNs with ca. 350 nm. The polydispersion indexes of the initial SLNs were indicative of monodispersed solutions (0.150), but after digestion these exhibited an increase (0.300). Zeta potential values, for both types of SLNs, demonstrated the maintenance of a good stability, with values of charges between -20 and -30 mV.

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