Nanoencapsulation and delivery of quercetin

MP Xavier\textsuperscript{a}; M Cabrera\textsuperscript{c}; P. Cabral\textsuperscript{c}; T. Lopez \textsuperscript{a,b}; A. Medrano\textsuperscript{a}

\textsuperscript{a}Departamento de Ciencia y Tecnología de los alimentos, Facultad de Química, Universidad de la República.
\textsuperscript{b}Centre Especial de Recerca, Planta de Tecnología de los Alimentos, Facultad de Veterinaria, Universidad Autónoma de Barcelona.
\textsuperscript{c}Centro de Investigaciones Nucleares, Facultad de Ciencias. Universidad de la Republica
amedrano@fq.edu.uy

In recent years nanotechnology has found innumerable applications in different food industries. Some potential applications of this technology are nanoencapsulation and delivery of bioactive components. Delivery systems are defined as those in which a bioactive material is entrapped in a carrier to control the rate of bioactive release.

Liposomes are hollow microspheres that spontaneously formed when water is added to a mixture of lipids. Its membrane consists of one or more bilayers of phospholipids, that trap part of the aqueous medium in which they are suspended. Liposomes have many benefits, e.g. capable of large-scale production using natural ingredients and entrapment and release of water-soluble, lipid-soluble, and amphiphilic substances, as well as targetability.

The objective of this work was to develop and study the stability of 3 formulations of liposomes varying the relation of its components (phosphatidylcholine: cholesterol): 14:0, 8:6 and 10:4 in order to incorporate quercitin inside Liposomes were made by the hand shaken method, using phosphatidylcholine and cholesterol in a medium of chlorophorm-methanol. They were extruded through polycarbonate filters to form unilamelars liposomes (LUVs). Characterization of the LUVs was made by differential scanning calorimetry (to determinate temperature and entalphy transition) and by study of particle size distribution profile. The determination of quercetin was performed using spectrophotometry.

Conclusion: liposomes developed on this work present good stability and a high percentage of retention of quercetin, with no significant differences between the three tested formulations during 21 days of study.