

5th Euro-Global Summit and Expo on

Food & Beverages

June 16-18, 2015 Alicante, Spain

Formulation and characterization of liposomes containing fatty acids omega-3 for food aplications

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O mega-3 polyunsaturated fatty acids (omega-3 FA) have shown beneficial effects on different pathologies as cardiovascular and skin diseases. Therefore, food supplementation with these fatty acids has emerged in the market. However, these types of foods are shelf limited due to omega-3 FA low oxidative stability. Recently, liposomes have appeared as a promising technology to protect these molecules: They are bio compatible vesicles which can be covered with bio adhesive compounds for enhanced bio availability. The objectives of the present work were to formulate liposomes containing omega-3 fatty acids to characterize them in size and morphology and to evaluate the effect of physical treatments (ultraturrax and sonication) in size distribution. In addition, the morphology of liposomes coated with whey or caseins from different milks (cow, sheep and goat) was characterized. Liposomes were formulated following the technique of film hydration utilizing phosphatidyl choline, cholesterol, esters of docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) at a final concentration of 2.68 mg/ml, 0.16 mg/ml and 1.7 mg/ml respectively. Size distribution was measured by dynamic light scattering, morphology by transmission electronic microscopy TEM and FA by gas chromatography. Vesicles obtained had 5 um size which diminished to 60 nm after physical treatments. Liposomes encapsulation efficiency was 30% and 20% for EPA and DHA respectively. As for morphology, liposomes without coating showed to be spherical and maintained high structural integrity; in turn, coated liposomes showed an irregular shape. The present work constitutes a preliminary study of liposome structures containing omega-3 FA with a view of potential applications in food formulations.

Biography

Maria Ayelen Velez is a Post-doctoral fellow at Instituto de Lactología Industrial (Universidad Nacional del Litoral- CONICET) in Santa Fe, Argentina and a Teaching Assistant in Applied Statistics at Facultad de Ingeniería Química. She has a PhD from Universidad Nacional del Litoral. During her Doctoral training she also spent a semester at Universidad de Granada, Spain, financiated by Erasmus Mundus fellowship.

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