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Design and characterization of liposomes containing bioactive fatty acids

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It is believed that conjugated linoleic acid (CLA) isomers have beneficial biological effects, which include the reduction of body fat content and mass muscle increment, stimulation of the immune system, inhibition of carcinogenesis. The aim of the present work was to formulate CLA-loaded liposomes for food aplications, to characterize them in size and to evaluate membrane fluidity. Liposomes were formulated following the technique of ethanol injection, utilizing soy phosphatidylcholine and conjugated linoleic acid isomers (9c, 11t and 10t, 12c) at two different ratios (A and B formulations, protected information). Controls (A and B) without CLA were included. Size distribution was measured by dynamic light scattering, efficiency by gas chromatography, and membrane fluidity by electron paramagnetic resonance (EPR) utilizing 5 SASL and 16 SASL spin labels. As for size, formulation B had the highest medium diameter (271.87 \pm 13.25 nm), followed by formulation A (203 \pm 1.33), which not differ from control A (197.53 \pm 16.12 nm) and control B (153.00 \pm 5.52). CLA encapsulation efficiencies were over 80 %, similar between formulations. Regarding membrane fluidity of CLA-liposomes, two behaviors were noticed. With 5 SASL, sensing the outer portion of the lipid bilayer, both CLA formulation A did not differed from controls, but formulation B showed decreased fluidity. In summary, CLA at both formulations disorders the outer membrane zone increasing its fluidity, but formulation B causes a decreased fluidity near the center of the membrane. The results could have implications in fatty acids digestibility; and they constitute a preliminary study with a view of potential applications in food formulations.

Biography

María Ayelén Vélez is a young researcher 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.

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