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The incorporation of Nutraceuticals in strategic reformulation of food products for better health, nutrition and disease prevention: The case studies of LCPUFA, Probiotics, Prebiotics, Phytosterol esters, β-glucan addition

## **Theodoros Varzakas**

Technological Educational Institute of Peloponnese, Greece

Nutraceuticals are potentially healthy foods that play a key role in humans wellbeing, health enhancement, disease prevention and treatment. For example, cardiovascular diseases occur in association with risk factors that are amenable to prevention or treatment by nutraceutical interventions. Several ingredients marketed for use in dietary supplements address such risk factors. The ability of nutraceuticals to favorably influence cardiovascular risk factors and atherosclerotic vascular disease should be recognized as a great opportunity for this disease prevention or treatment. There is a pressing need for edible delivery systems to encapsulate, protect, and release bioactive lipids within the

food, medical, and pharmaceutical industries. The fact that these delivery systems must be edible puts constraints on the type of ingredients and processing operations that can be used to create them. The major bioactive lipids that need to be delivered within the food industry (for example,  $\omega$ -3 fatty acids, and phytosterols), highlight the main challenges to their current incorporation into foods. The delivery systems used were produced from food-grade (GRAS) ingredients (for example, lipids, proteins, polysaccharides, surfactants, and minerals) using simple processing operations (for example, dough mixing, homogenizing, extrusion and drying).

e: theovarzakas@yahoo.gr

