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Food enrichment with omega-3: New oilseed sources and algal oils for microencapsulation and delivery of healthy lipids

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Omega-3 fatty acids like EPA and DHA play a vital role in health and correct nutrition, especially during fetal and infant growth. Omega-3 acids are also important for reducing the risk of cardiovascular diseases and prevention of nervous system and inflammatory diseases. Health authorities along the world have promoted the intake of foods that contain higher amounts of omega-3 fatty long chain acids and a favorably ratio ω6/ω3 essential fatty acids. Subsequently, in recent years, there has been a growing interest in alternative sources of omega-3 oils, like new oilseeds (chia (*Salvia hispanica* L.), camelina (*Camelina sativa* L.), etc.) and microalgae like Nannochloropsis, Isochrysis and others. Modern extraction techniques such as pressurized liquids extraction (PLE) with "green" solvents have advantages over traditional techniques for oil extraction and allow the replacement of hexane as solvent. At the same time, food enrichment with omega-3 oils requires the protection of the polyunsaturated fatty acids (PUFA) during all the process. Different strategies to this aim include use of synergic antioxidants and microencapsulation of oils. In recent years, there has been a growing interest in microencapsulation for a variety of applications in the food and pharmaceutical industries to protect the active substances, and simultaneously, provide a controlled release of the active substances, masking its unpleasant taste and smell and allowing new forms of delivery of bioactive compounds, such as in this case, healthy lipids with omega-3 in solid form. In addition, the new omega-3 oils are used to produce structured lipids by enzymatic modification, with improved health and nutritional properties that can also be microencapsulated for food enrichment, producing healthy lipids with desired characteristics to improve the lipid profile of final food products.

Biography

Francisco J Señoráns has developed his research and teaching career in Food Science and Technology in different Spanish and international institutions during the last 25 years. He served in Madrid (CSIC and UAM) and at Uppsala University (Sweden) as Researcher and Lecturer for two years. He has Chemical Sciences PhD and since 2002 he is Professor Titular (Associate Professor) at Universidad Autonoma de Madrid (Spain), where he has been responsible of several research projects and contracts with industry. He was In-charge of the management and creation of the Joint Institute in Food Science Research (CIAL) as a Co-director since its foundation in July 2007. He is co-author of more than 100 publications of international impact (SCI) with h index of 31 (Web of Science) and of several international patents transferred to industry. In 2001, he received the Prize "Archer Daniels" granted by the AOCS. At present, he directs a research team with a sound record of research contract with food and pharma industry, in projects related with healthy lipids, including omega-3 fractionation and enrichment of fish and marine oils, microalgae components extraction with compressed fluids and supercritical technology, and enzymatic technologies for structured lipids, hipocaloric oils, and phospholipids.

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