

UNIVERSIDAD DE BURGOS
ESCUELA DE DOCTORADO

TESIS DOCTORALES

TÍTULO: FISH OIL VALORIZATION USING SUPERCRITICAL CARBON DIOXIDE TECHNOLOGIES
(VALORIZACIÓN DE ACEITE DE PESCADO MEDIANTE TECNOLOGÍAS DE DIÓXIDO DE CARBONO SUPERCRÍTICO)

AUTOR: MELGOSA GÓMEZ, RODRIGO

PROGRAMA DE DOCTORADO: AVANCES EN CIENCIA Y BIOTECNOLOGÍA ALIMENTARIAS

FECHA LECTURA: 22/06/2018

HORA: 11:30

CENTRO LECTURA: FACULTAD DE CIENCIAS. SALÓN DE ACTOS.

DIRECTORAS: SAGRARIO BELTRÁN CALVO – MARÍA TERESA SANZ DÍEZ

TRIBUNAL: MARÍA JOSÉ COCERO ALONSO
JOSÉ MANUEL BENITO MORENO
DÑA. ELISABETH BADENS
ALEXANDRE PAIVA
ESTHER DE PAZ BARRAGÁN

RESUMEN: This PhD Thesis is focused on the application of supercritical fluid (SCF) technologies to the production and formulation of concentrates of omega-3 polyunsaturated fatty acids (*n*-3 PUFAs).

Conventional production of *n*-3 PUFA concentrates uses non-environmentally friendly organic solvents and high temperatures that are detrimental to the easily-oxidizable *n*-3 PUFAs. Alternatively, supercritical fluid (SCF) technologies can overcome these drawbacks, offering the possibility of obtaining *n*-3 PUFAs without solvent residues at mild, non-oxidative conditions.

Combining the advantages of SCF and enzymatic technologies, this Thesis investigates the lipase-catalyzed ethanolysis of fish oil in supercritical carbon dioxide (SC-CO₂) media, focusing on important aspects of the reaction, such as the potential effects of SC-CO₂ exposure on several lipases, the phase equilibrium of the reaction system (fish oil + ethanol + CO₂) at high pressures, and the kinetics of the lipase-catalyzed ethanolysis reaction in SC-CO₂.

Additionally, an *n*-3 PUFA concentrate has been encapsulated by Particles from Gas-Saturated Solutions (PGSS)-drying, obtaining solid microparticles with high bioactive load and enhanced stability against oxidation, compared to a similar product obtained

by conventional spray-drying.