Production of omega-3 concentrates using supercritical carbon dioxide

M. T. Sanz, R. Melgosa, Á. G. Solaesa, O. Benito, E. de Paz and S. Beltrán

Biotechnology and Food Science Department. Chemical Engineering Section. Universidad de Burgos. E-mail: beltran@ubu.es

Extraction of oil from fish products or by-products or algae using supercritical carbon dioxide (scCO₂) (3-4)

- Inert atmosphere that prevents oil oxidation
- Organic solvents are avoided
- Possibility of fractionation to lower acidity
- No phospholipids extracted
- Lower temperatures than conventional methods

Omega-3 rich oil

Reaction in supercritical carbon dioxide media to obtain ethyl esters or structures triglycerides (3-4)

- Inert atmosphere that prevents reagents and products oxidation
- Lower media viscosity
- Faster reaction rates
- Media homogeneity
- Expanded media
- Lower temperatures than conventional methods

Mixture of oil derivatives

Separation of omega-3 derivatives by liquid-scCO₂ countercurrent fractionation (7)

- Inert atmosphere that prevents concentrates oxidation
- Organic solvents are avoided
- Lower temperatures than conventional methods

Omega-3 PUFA concentrates

Omega-3 encapsulation by PGGS-Drying

- Inert atmosphere avoid concentrates oxidation
- Mask odors and flavors
- Low temperatures prevent product degradation

Formulations of omega-3 PUFA concentrates

Acknowledgments: Financial support from the Junta de Castilla y León and ERDF for project BU055U16 and OB’s contract is gratefully acknowledged. To MINECO

References:


7. Güçlü, Ü., Temelli, F. Correlating the solubility behavior of fatty acids, mono-, di-, and triglycerides, and fatty acid esters in supercritical carbon dioxide. Industrial and Engineering Chemistry Research, 39, 12, pp. 4756-4766


13. García-Escudero, D., Temelli, F. Correlating the solubility behavior of fatty acids, mono-, di-, and triglycerides, and fatty acid esters in supercritical carbon dioxide. Industrial and Engineering Chemistry Research, 39, 12, pp. 4756-4766

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