Optimisation of rancidity stability in long-chain PUFA concentrates obtained from a rainbow trout (Oncorhynchus mykiss) by-product

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 This research was focused on the production of polyunsaturated fatty acid concentrates from a farmed rainbow trout (Oncorhynchus mykiss) by-product (i.e. belly muscle). The effect of different process variables (urea/fatty acids (FA) contents ratio, crystallisation time and temperature and stirring speed of the urea/FA mixture) on the lipid oxidation development during the urea complexation process was investigated. For this purpose, an experimental design (26 runs) following the response-surface methodology was developed. As a result, peroxide value and TOTOX index showed to be dependent on the crystallisation time and temperature and the urea/FA ratio, while no influence of the crystallisation stirring speed was detected on both indices; additionally, polyene index was affected by the urea/FA ratio and its interaction with the crystallisation time. An optimised desirability score near 1.0 was attained provided values of 2.8 °C, 3.05 h a