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Industrial production of a balanced virgin olive oil

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10

11 Abstract

12 The aim of this work is to obtain a balanced commercial virgin olive oil (VOO) using
13 response surface methodology at an industrial level under continuous working
14 conditions. Thus, a factorial design was developed with three factors: sieve size of the
15 hammer mill, temperature, and malaxing time. Forty different responses were
16 modulated, including extraction efficiency, but with special attention to phenolic and
17 volatile compounds because they are responsible for the taste and aroma of VOO. The
18 conditions for malaxing were 22 and 32 °C for 60 and 120 min using 5 and 6 mm sieve
19 sizes.

20

21 After modeling the responses, the highest extraction efficiency was obtained at 32 °C
22 and 120 min; similar conditions were necessary to obtain the maximum contents of
23 chlorophyll, carotenoid, and phenolic compounds, but the maximum content of volatile
24 compounds was obtained at 22 °C. Therefore, it has also realized a combined
25 optimization of total phenolics and total volatiles.

26

27 Keywords

28 Virgin olive oil; Extraction yield; Phenolic compounds; Volatile compounds; Response
29 surface methodology

30

31 Chemical compounds studied in this article

32 hydroxytyrosol (PubChem CID: 82755)

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