Foods 2020

The 1st International Electronic Conference on Food Science and Functional Foods

10–25 NOVEMBER 2020 | ONLINE

María del Carmen Razola-Díaz, Eduardo Jesús Guerra-Hernández, Celia Rodríguez-Pérez, Ana María Gómez-Caravaca, Belén García-Villanova and Vito Verardo

Optimization of Ultrasound Assisted Extraction of Phenolic Compounds from Orange By-product

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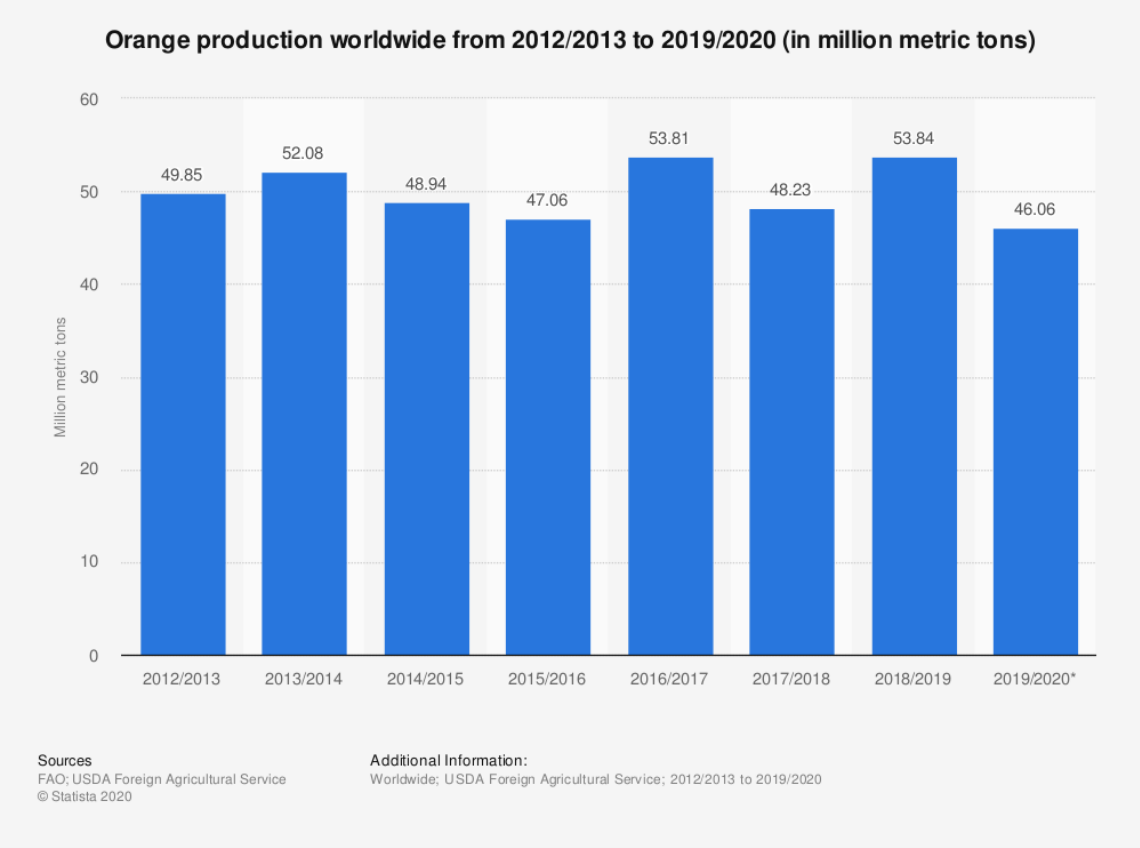
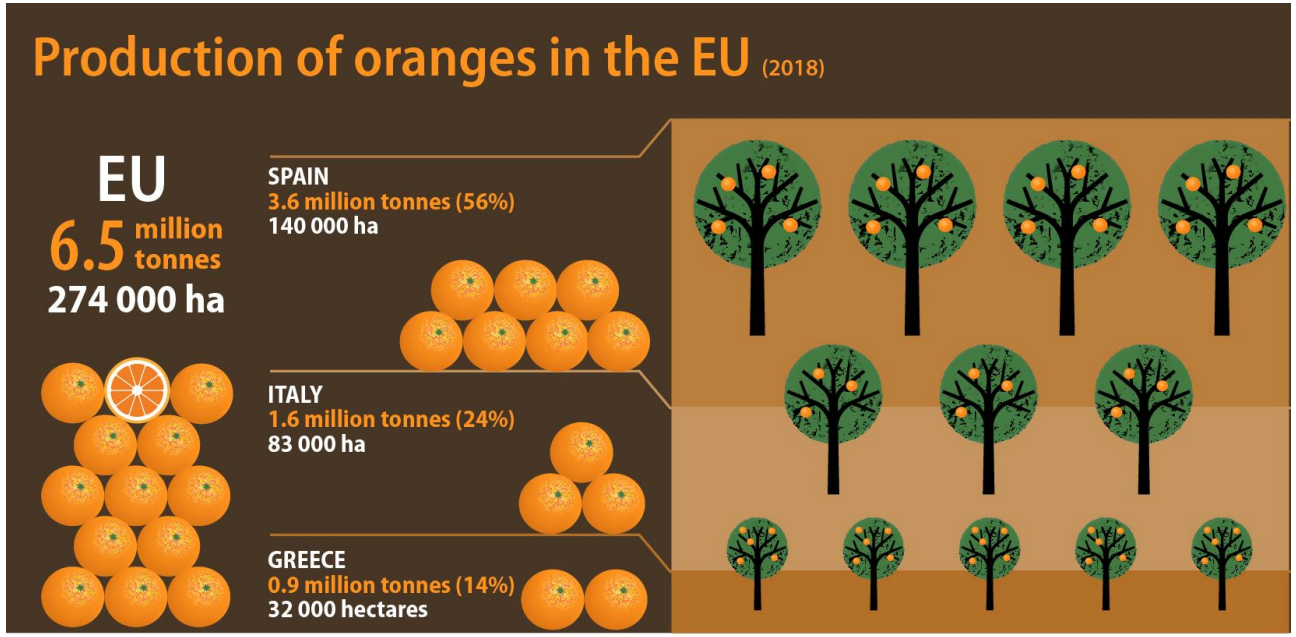
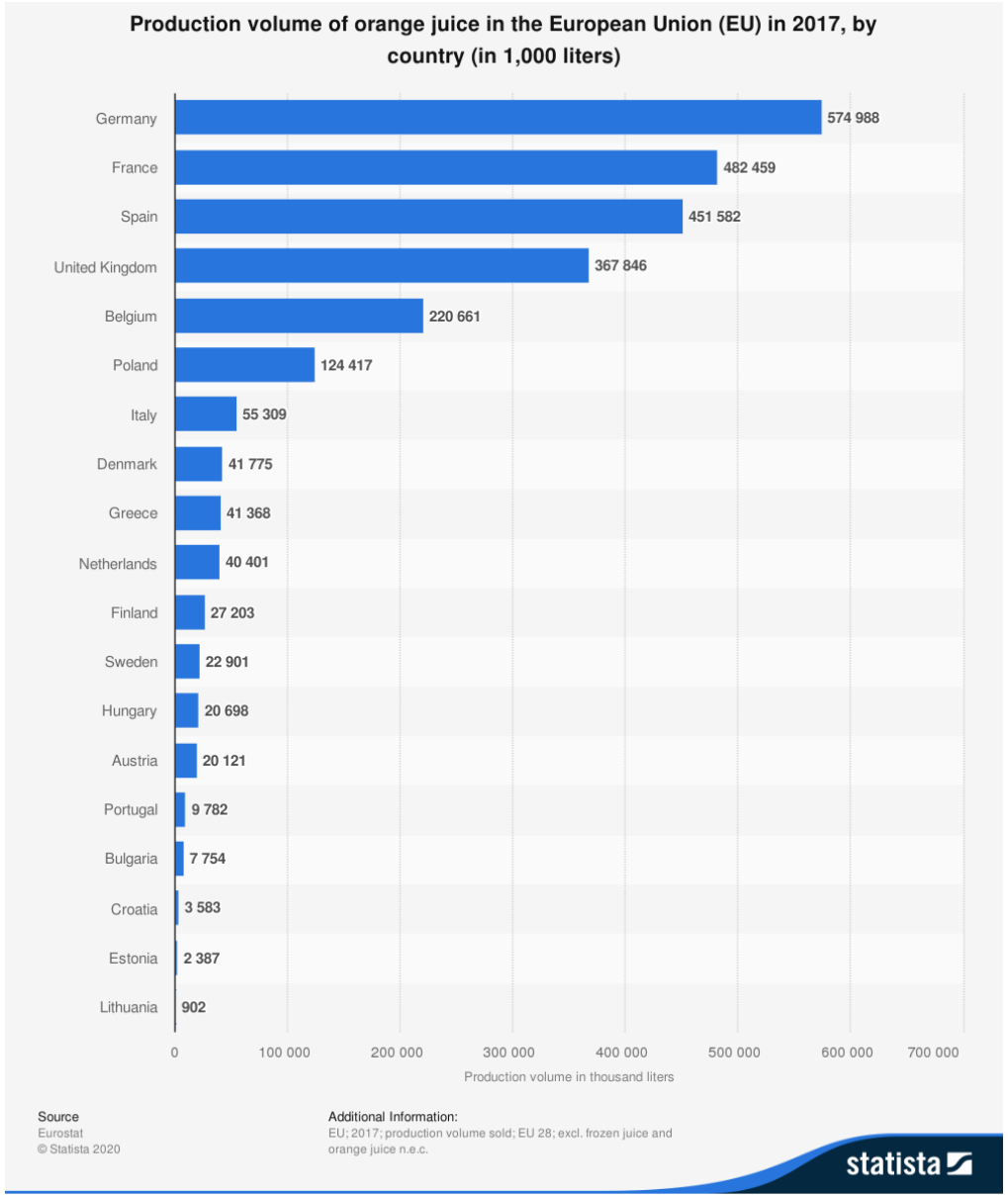
1. INTRODUCTION





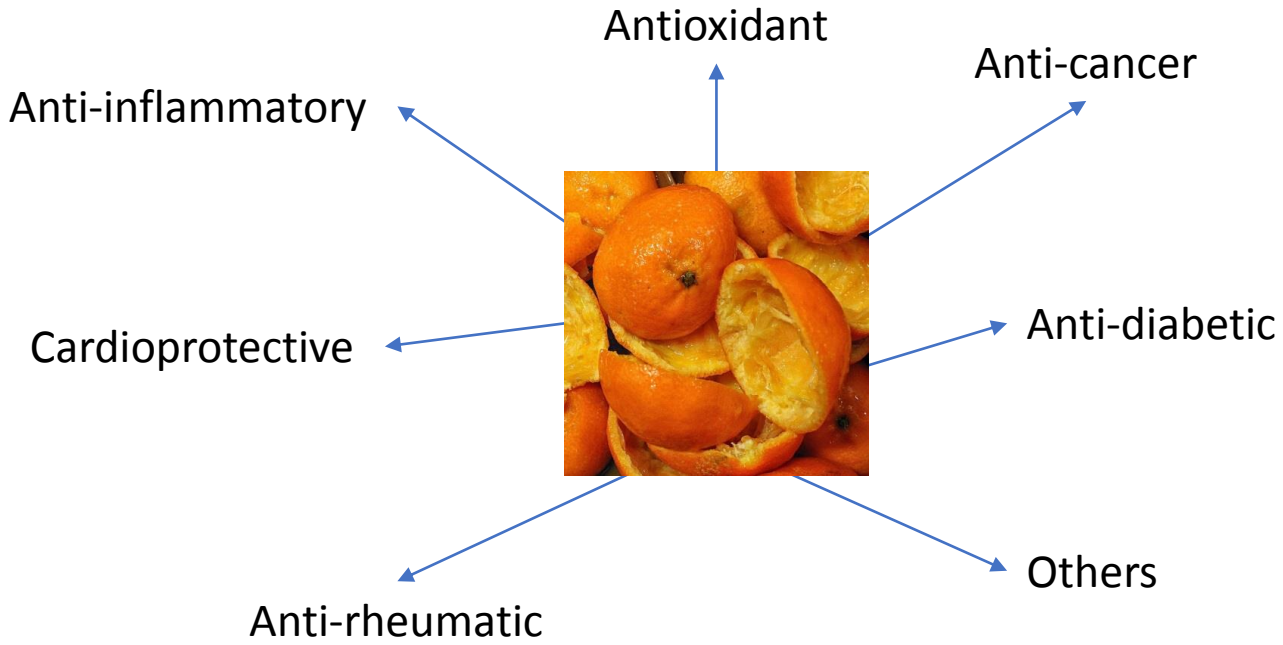
1. INTRODUCTION



PROCESSING

BY-PRODUCT

BIOACTIVE COMPOUNDS SOURCE



2. MATERIALS AND METHODS

-18ºC

3. MATERIALS AND METHODS

Table 2. Box Behnken desing with encoded values.

	Independet factors			
	Ethanol/water (v/v)	Time (min)	Amplitude (%)	Pulse (%)
1	-1	-1	0	0
2	1	-1	0	0
3	-1	1	0	0
4	1	1	0	0
5	0	0	-1	-1
6	0	0	1	-1
7	0	0	-1	1
8	0	0	1	1
9	0	0	0	0
10	-1	0	0	-1
11	1	0	0	-1
12	-1	0	0	1
13	1	0	0	1
14	0	-1	-1	0
15	0	1	-1	0
16	0	-1	1	0
17	0	1	1	0
18	0	0	0	0
19	-1	0	-1	0
20	1	0	-1	0
21	-1	0	1	0
22	1	0	1	0
23	0	-1	0	-1
24	0	1	0	-1
25	0	-1	0	1
26	0	1	0	1
27	0	0	0	0

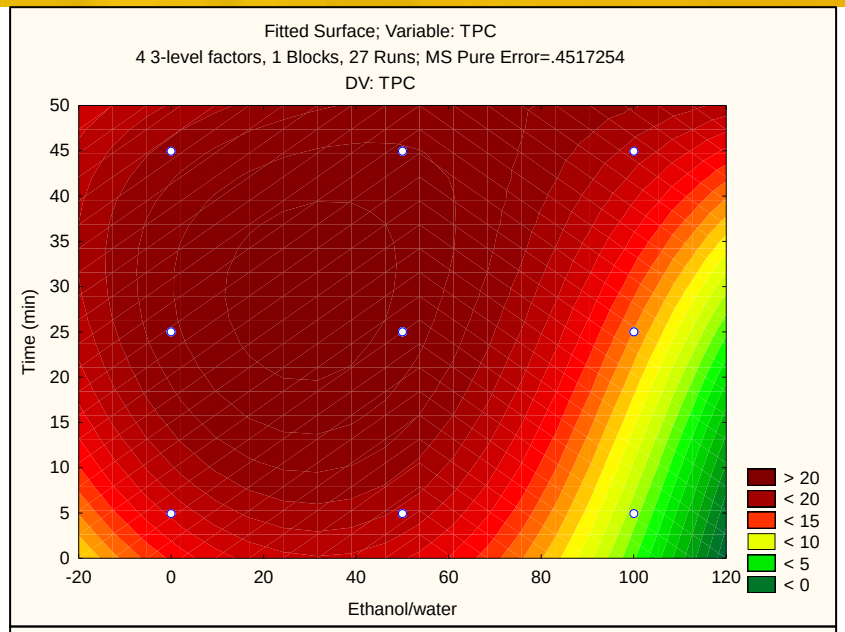
- BOX BEHNKEN DESING (Table 2)

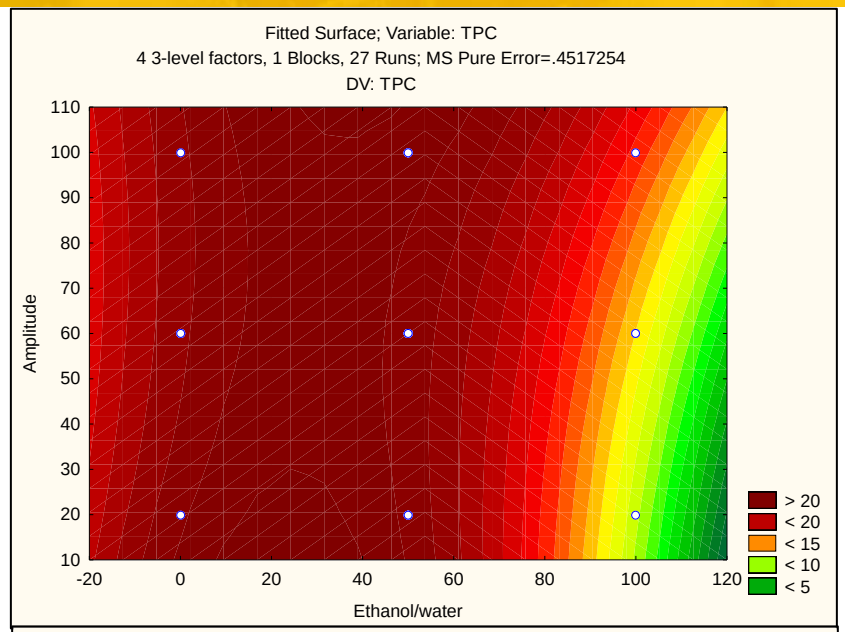
$$Y = \beta_0 + \sum_{i=0}^{4} \beta_i X_i + \sum_{i=0}^{4} \beta_{ii} X_{ii}^2 + \sum_{i=0}^{4} \sum_{j=0}^{4} \beta_{ii} X_i X_j$$

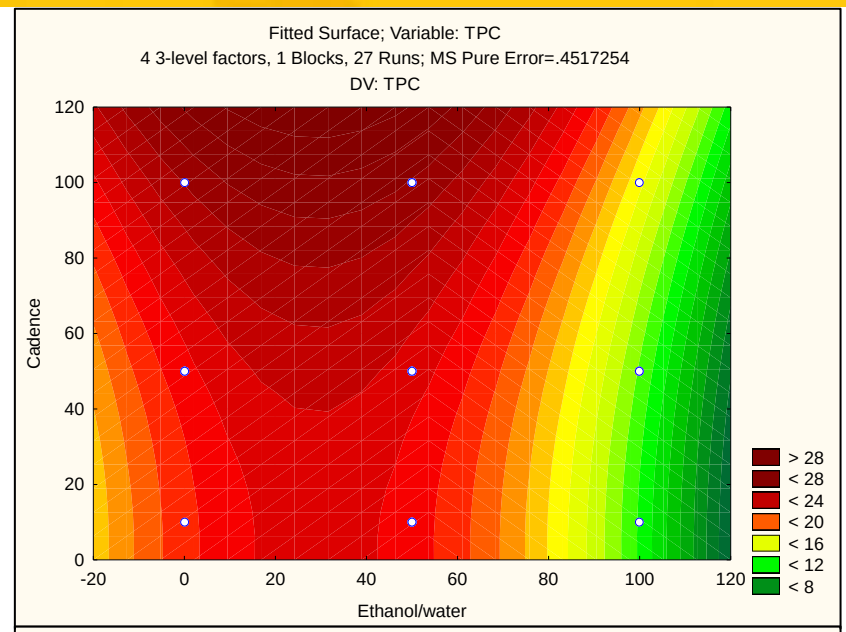
Ethanol/water: 0, 50, 100 (v/v)
Time: 5, 25, 45 min
Amplitude: 20, 60, 100%
Pulse: 10, 50, 100%

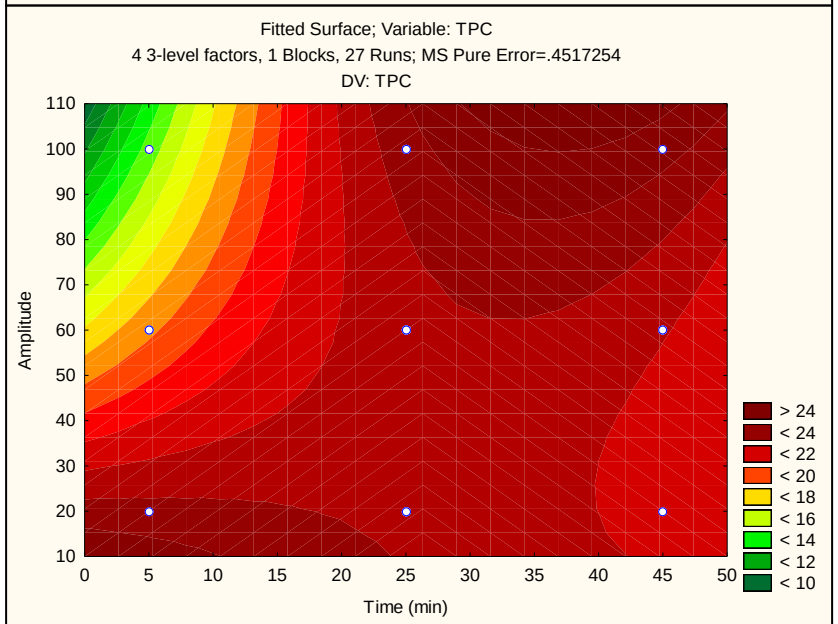
- DATA PROCESSING →STATISTICA 7.0
- OPTIMAL CONDITIONS → SURFACE RESPONSE METHODOLOGY
- TOTAL PHENOLIC COMPOUNDS
  - → FOLIN METHOD
  - → IONIC HPLC
- ANTIOXIDANT ASSAYS
  - →ABTS
  - → DPPH

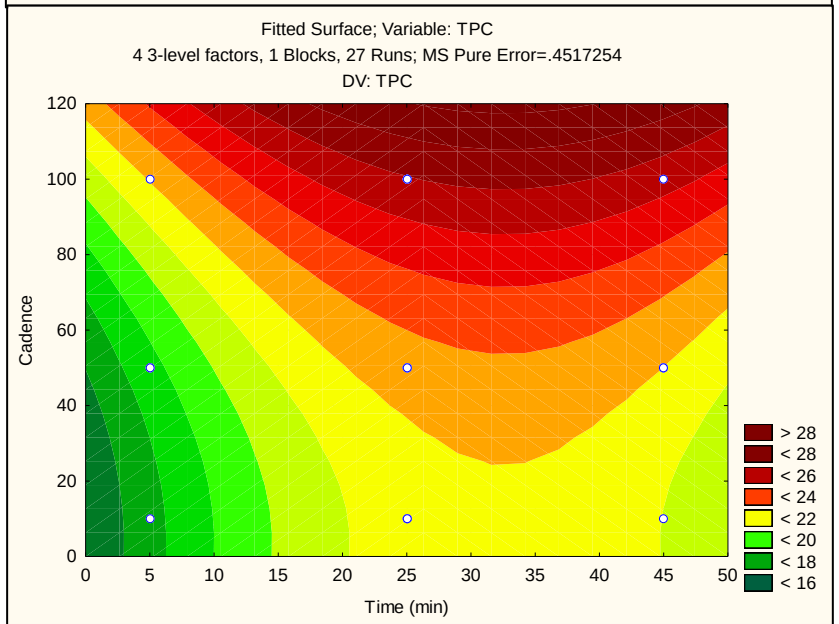
2. RESULTS AND DISCUSSION

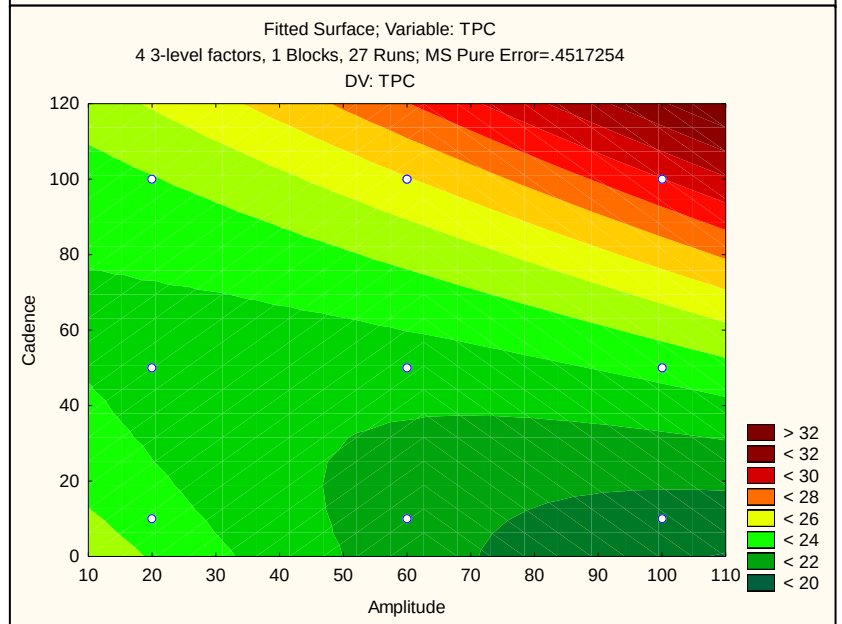












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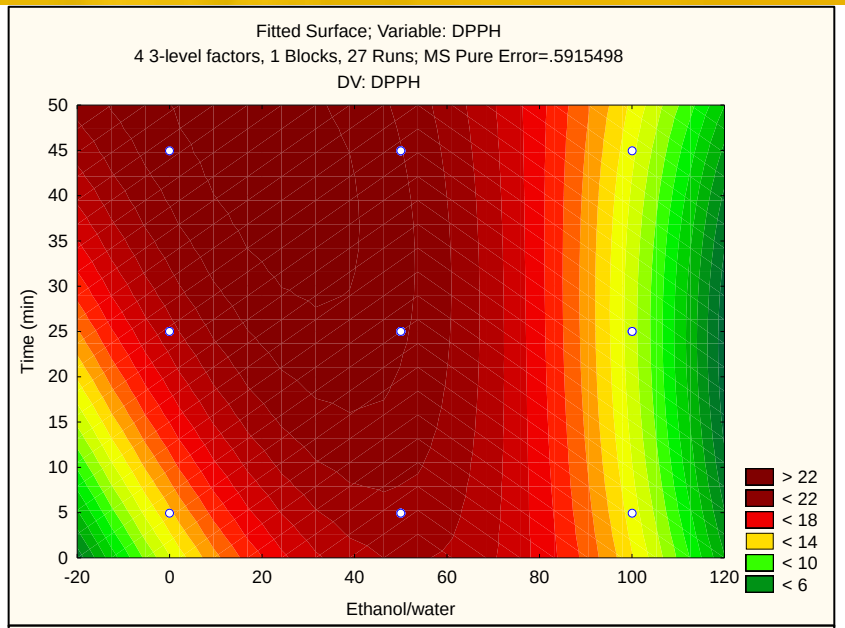

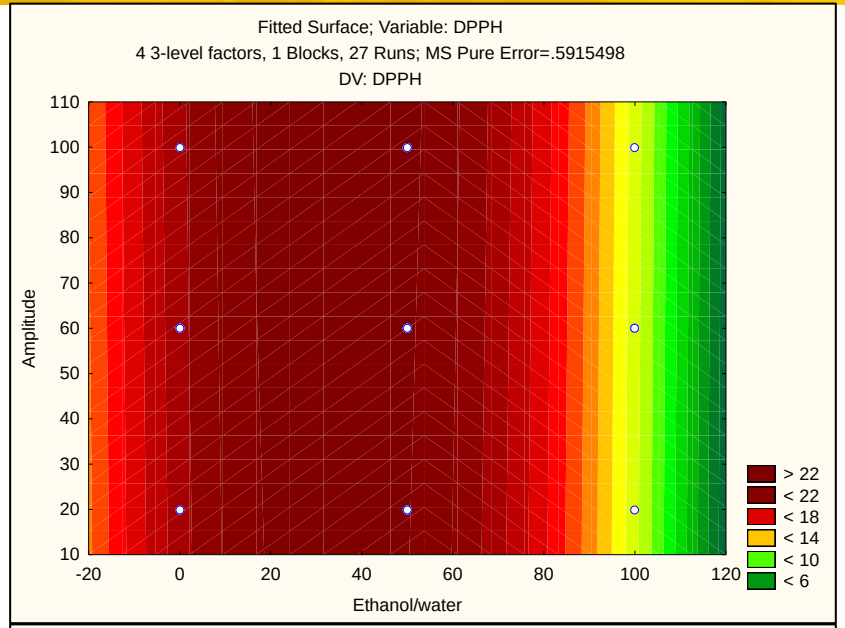

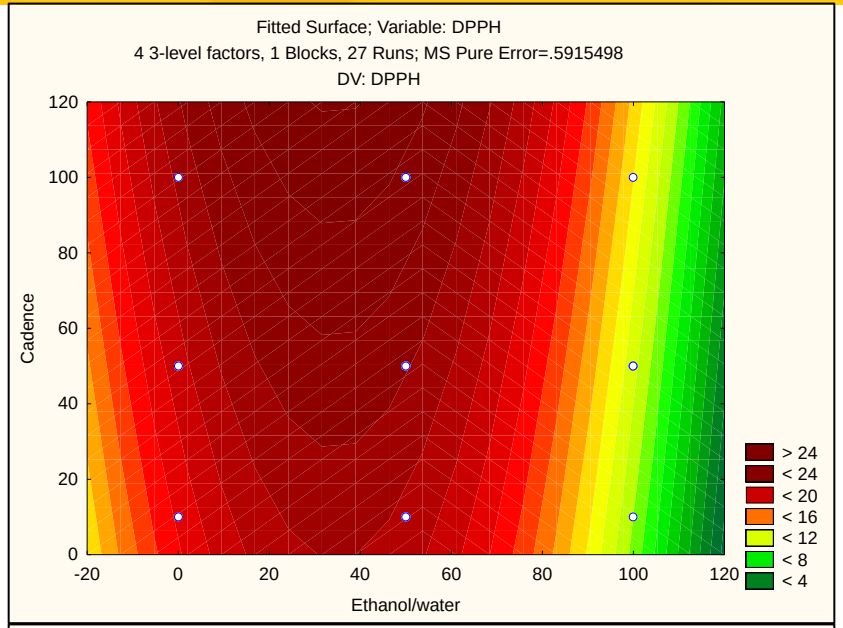

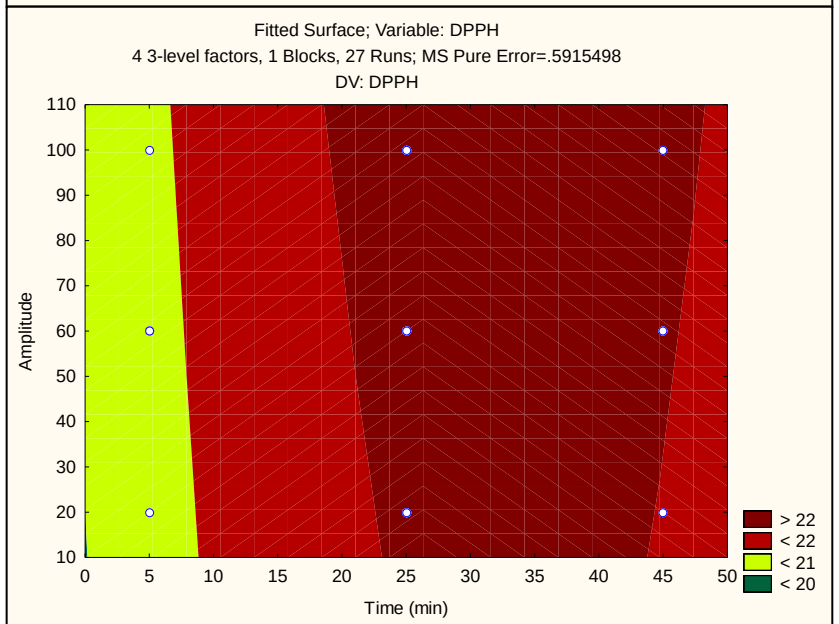

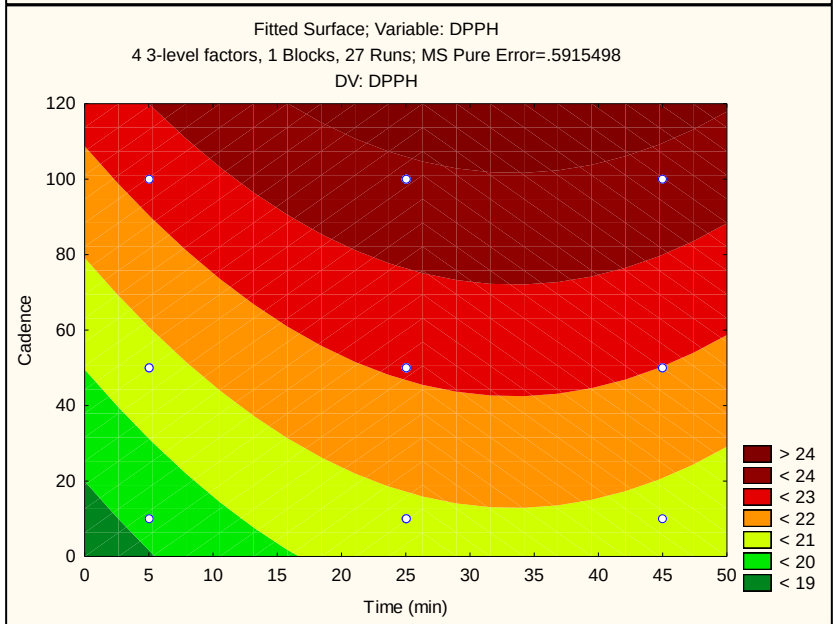

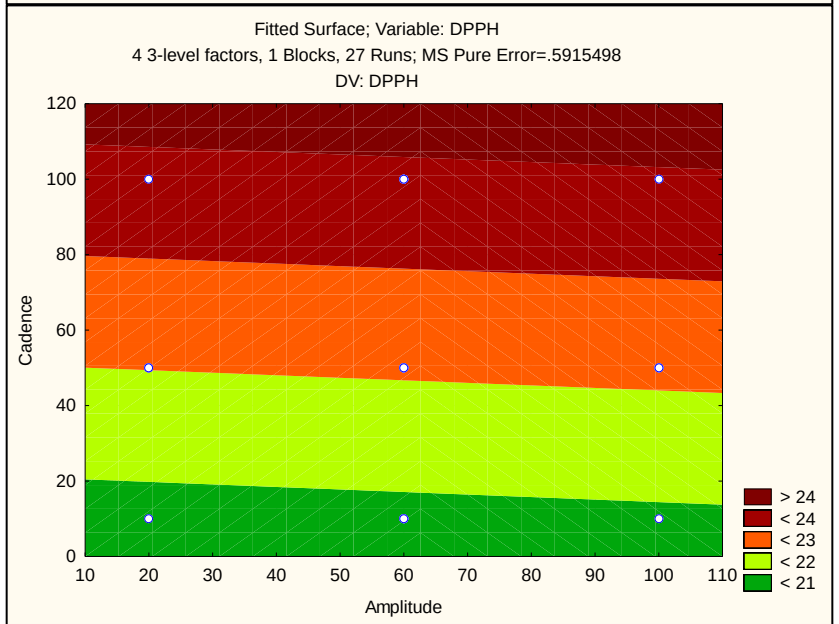

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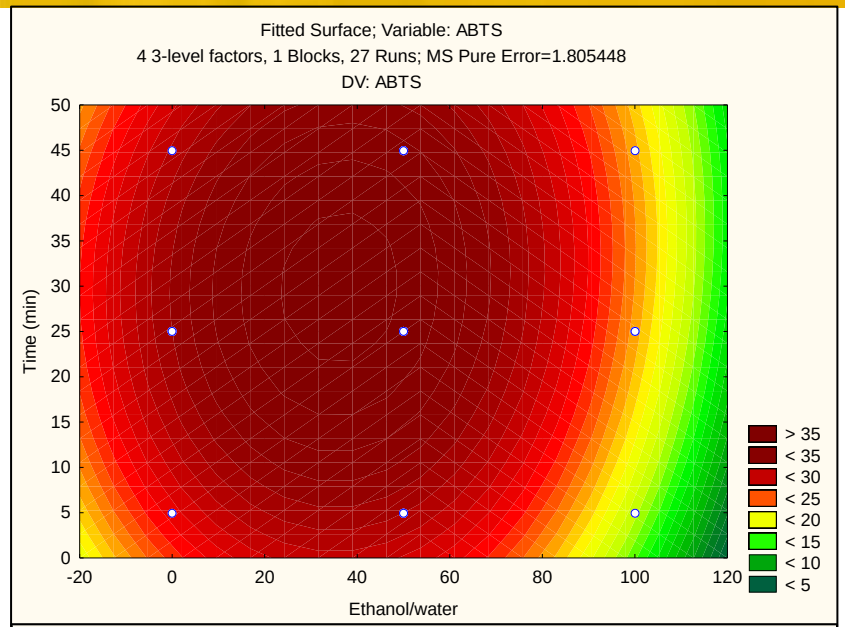

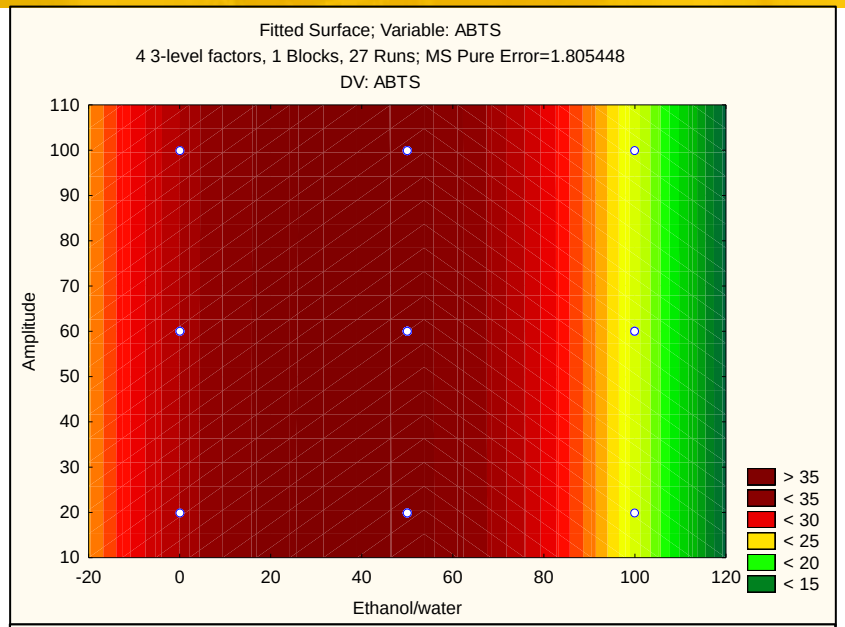

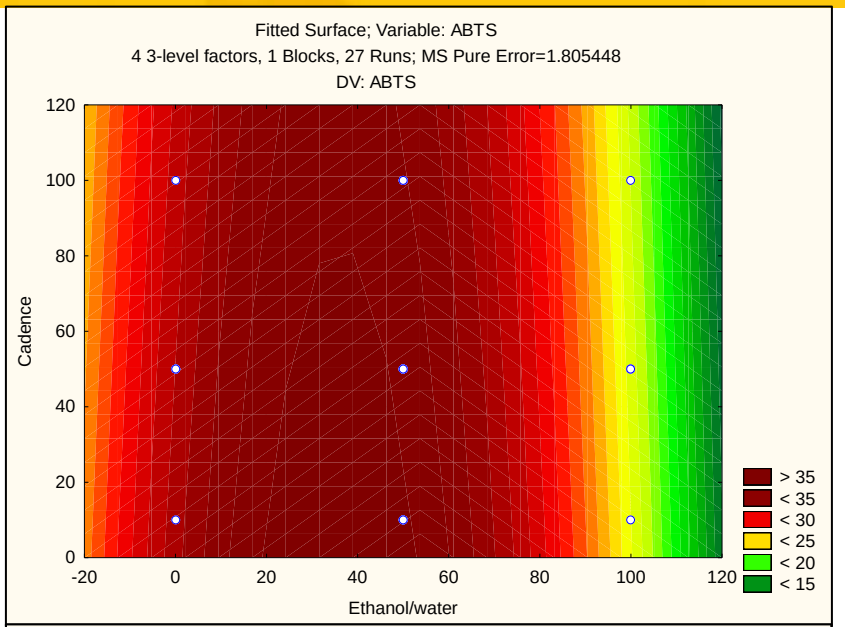

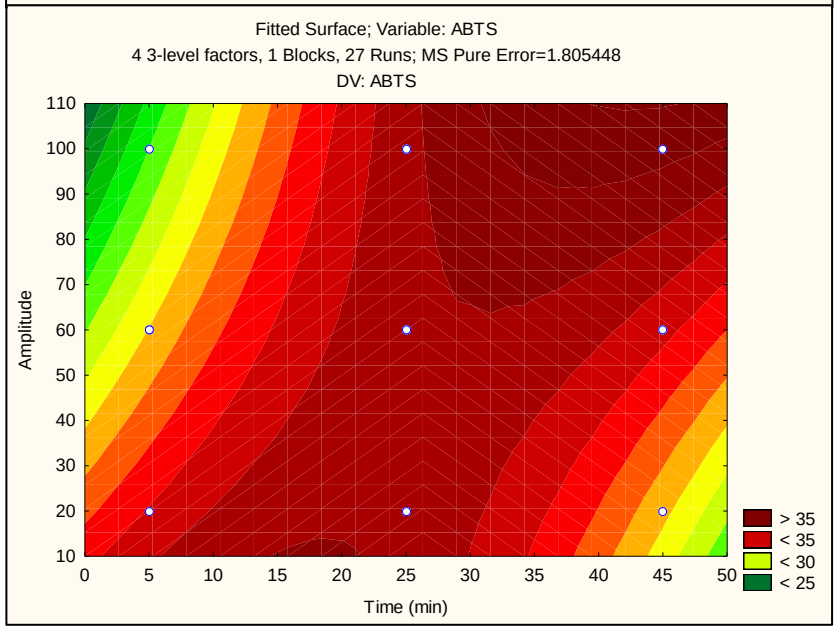

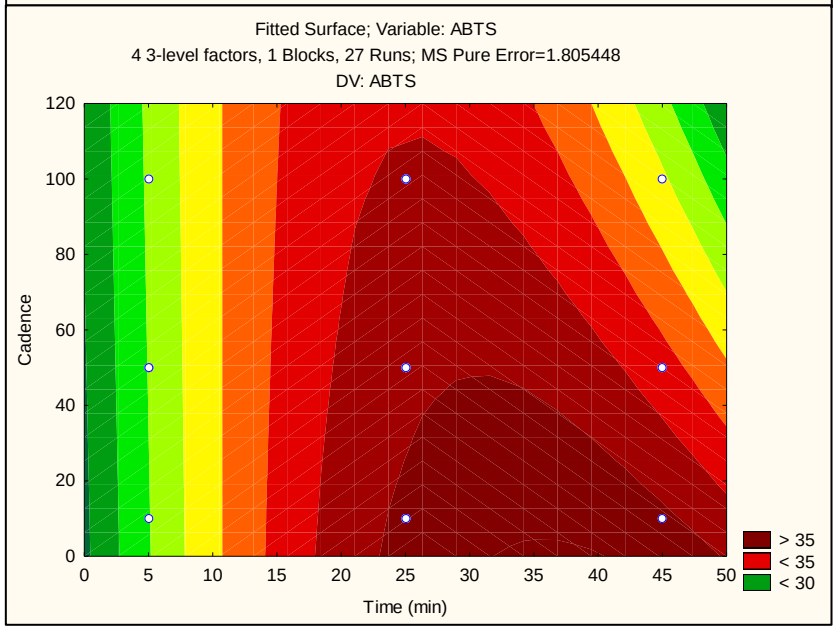

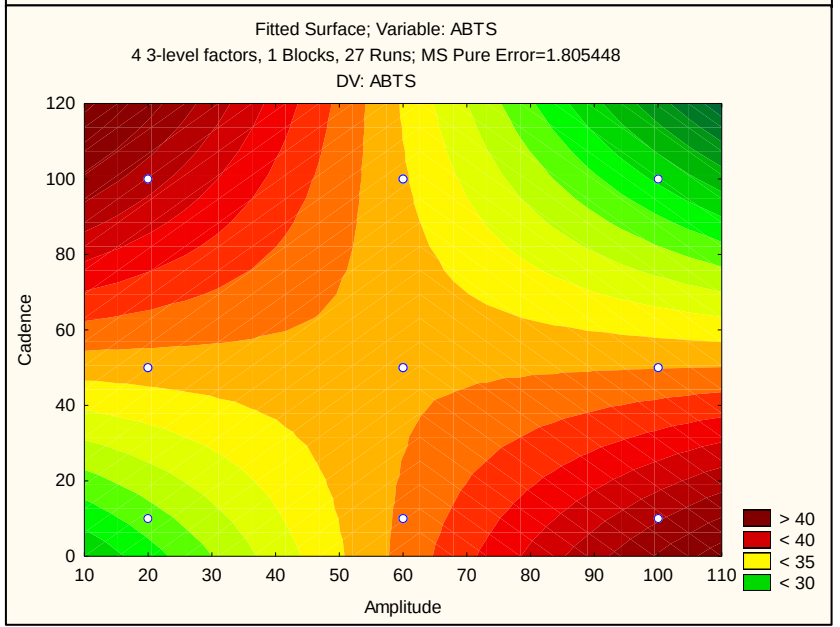

2. RESULTS AND DISCUSSION

ANOVA	TPC	ABTS	DPPH
R^2	0.9564	0.9286	0.8694
p Regression model	0.0011	0.0043	0.0001
p Lack of fit	0.1522	0.2624	0.1117

Parameter	Optimal conditions		
Ethanol/water (% (v/v))	45		
Time (min)	35		
Amplitude (%)	90		
Pulse (%)	100		
	TPC	**DPPH**	**ABTS**
Predicted value (mg/g d.w.)	29.36 ± 3.5	24.44 ± 3.6	32.02 ± 7.0
Obtained value (mg/g d.w.)	30.42 ± 1.5	26.37 ± 1.6	35.62 ± 2.1

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