

Supplementary material to

MATHEMATICAL MODELLING AS A TOOL IN KOMBUCHA BEVERAGES BIOACTIVE QUALITY CONTROL

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Table S1. Total flavonoids content of winery effluent based kombucha products.

Sample*	Total flavonoids ($\mu\text{g RE/mL}$)**
IM	99.4 \pm 2.1
DM3	24.8 \pm 0.3
DM5	36.4 \pm 1.5
DM7	51.8 \pm 0.5
KWE-0-3	25.4 \pm 0.8
KWE-0-5	38.3 \pm 0.7
KWE-0-7	49.1 \pm 0.3
KWE-3-3-20	50.4 \pm 6.8
KWE-3-3-25	23.2 \pm 0.2
KWE-3-3-30	16.3 \pm 0.8
KWE-3-5-20	28.6 \pm 0.3
KWE-3-5-25	31.6 \pm 1.0
KWE-3-5-30	22.9 \pm 0.8
KWE-3-7-20	32.5 \pm 0.3
KWE-3-7-25	44.3 \pm 3.8
KWE-3-7-30	31.1 \pm 0.7
KWE-6-3-20	37.2 \pm 0.5
KWE-6-3-25	18.5 \pm 0.7
KWE-6-3-30	15.9 \pm 0.8
KWE-6-5-20	38.0 \pm 5.1
KWE-6-5-25	24.0 \pm 1.0
KWE-6-5-30	23.2 \pm 0.3
KWE-6-7-20	36.1 \pm 1.3
KWE-6-7-25	33.2 \pm 0.7
KWE-6-7-30	40.8 \pm 3.6
KWE-9-3-20	29.8 \pm 1.2
KWE-9-3-25	21.7 \pm 2.0
KWE-9-3-30	17.5 \pm 0.5
KWE-9-5-20	27.0 \pm 1.2
KWE-9-5-25	27.6 \pm 1.3
KWE-9-5-30	26.4 \pm 0.5
KWE-9-7-20	62.6 \pm 6.3
KWE-9-7-25	38.8 \pm 0.2
KWE-9-7-30	37.4 \pm 1.3

*IM - initial medium; DM3, DM5 and DM7-diluted medium with 3, 5 and 7% of total sugars; KWE - kombucha on winery effluent; the first number after the KWE represents the fermentation day (0, 3, 6 or 9); the second number after the KWE represents the total sugars content (3, 5 or 7%) and the third number after the KWE represents the fermentation temperature (20, 25 or 30 °C). ** - mean \pm StDev, n=3.

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Table S2. Analysis of variance (ANOVA) for total flavonoids content.

Source	df	SS	MS	F-value	p-value
Model	9	919.60	102.20	10.04	0.0103
Residual	5	50.90	10.18		
Lack-of-fit	3	49.08	16.36	17.98	0.0531
Pure error	2	1.82	0.9100		
Total	14	970.50			
		R ² 0.9476			

Table S3. Sensory characteristics of winery effluent based kombucha products.

Colour					
t [°C]	time [day]	7%	5%	3%	
	0	4	3	3	
	3	4	3	3	
	6	5	5	4	
30	9	4	4	3	
	3	2	2	2	
	6	2	2	1	
25	9	4	4	3	
	3	3	3	3	
	6	2	1	1	
20	9	4	3	1	
	Odour				
	t [°C]	time [day]	7%	5%	3%
	0	2	2	2	
	3	4	5	4	
	6	3	3	3	
30	9	1	1	1	
	3	3	4	4	
	6	2	2	3	
25	9	1	1	1	
	3	4	5	4	
	6	2	3	3	
20	9	1	1	1	
	Taste				
	t [°C]	time [day]	7%	5%	3%
	0	1	1	1	
	3	4	5	4	
	6	2	3	2	
30	9	1	1	1	
	3	5	5	3	
	6	2	3	3	
25	9	1	1	1	
	3	4	5	4	
	6	2	3	2	
20	9	1	1	1	
	Total sensory mark				
	t [°C]	time [day]	7%	5%	3%
	0	2	2	2	
	3	4	4	4	
	6	3	4	3	
30	9	2	2	2	
	3	3	4	3	
	6	2	2	2	
25	9	2	2	2	
	3	4	4	4	
	6	2	2	2	
20	9	2	2	1	

Table S4. Analysis of variance (ANOVA) for total sensory mark.

Source	df	SS	MS	F-value	p-value
Model	2	5.000	2.500	11.54	0.0016
Residual	12	2.600	0.2167		
Lack-of-fit	10	1.933	0.1933	0.5800	0.7727
Pure error	2	0.667	0.3333		
Total	14	7.600			
	R ²	0.6579			