

Correction

Correction: The Effect of UV-C Stimulation of Potato Tubers and Soaking of Potato Strips in Water on Color and Analyzed Color by CIE L*a*b* Sustainability 2020, 12, 3487

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Given that the expressions of concern in this paper [1] have raised a signification nature of UV-C stimulation of potato tubers's effects on French fries' color, the authors, yet, contend that the outcome of the paper [1] did not fulfill to cover the insights of the research project based on inconclusive evidence of the recent major concerns raised in readership. Consequentially, the authors have extended this research and would like to update the published paper in the following aspects. The new version has been peer reviewed by original reviewers.

The changes are as follows:

(1) Replacing the title:

Application of the CIE L*a*b* Method for the Evaluation of the Color of Fried Products from Potato Tubers Exposed to C Band Ultraviolet Light
with

The Effect of UV-C Stimulation of Potato Tubers and Soaking of Potato Strips in Water on Color and Analyzed Color by CIE L*a*b*

(2) Change the description of the statements in Sections 1 and 2 to refine the purpose and scope of the research:

- experiments were conducted in the period 2017–2018
- potato strips were soaked in water the following combinations:
 - (1) 20 °C for 15 min and
 - (2) 40 °C for 20 min.
- Using the CIE L*a*b* method based on instrumental color measurement.

(3) To extend the research, the authors replaced Table 1:

Table 1. Analysis of variance in a single classification. The effects of the relationships between the parameters of potato tuber exposure on the selected color evaluation ratios of the french fries determined by the CIE L*a*b* method (ΔL^* , Δa^* , Δb^* , ΔE^* , ΔC^* , ΔH^*).

Parameters of Variance Analysis	Brightness Difference $\Delta L^*[-]$	Difference $\Delta a^*[-]$	Difference $\Delta b^*[-]$	The Total Color Difference $\Delta E^*[-]$	Color Difference $\Delta C^*[-]$	Tone Difference (Shade) $\Delta H^*[-]$
F Snedecor statistics	12.026	13.541	14.082	9.076	14.071	8.501
Test probability	0.000	0.000	0.000	0.000	0.000	0.000

With

Table 1. Analysis of variance in multiple classification. Influence of tuber stimulation, immersion conditions of semi-finished products, type of frying and place of color measurement on image brightness (L^*), chromaticity of image (a^*) and chromaticity of image (b^*) determined by CIE L*a*b*.

Qualitative Predictor	L*		a*		b*	
	Value					
	Statistics F Snedecora	Probability of Test	Statistics F Snedecora	Probability of Test	Statistics F Snedecora	Probability of Test
Free	442,735.1	0.000000	1286.534	0.000000	29,294.83	0.000000
{1} stimulation	64.7	0.000000	348.345	0.000000	342.44	0.000000
{2} immersion conditions	16.0	0.000000	20.359	0.000000	68.65	0.000000
{3} type of frying	0.0	0.896456	2.420	0.119807	0.59	0.443266
{4} place of measurement	9.9	0.001691	29.140	0.000000	14.74	0.000125

(4) To clearly represent the experiment results, the authors replaced Table 2

Table 2. Average values of the selected color evaluation ratios for french fries determined by the CIE L*a*b* method (ΔL^* , Δa^* , Δb^* , ΔE^* , ΔC^* , ΔH^*).

Relations between Experiment Combinations	Brightness Difference $\Delta L^*[-]$	Difference $\Delta a^*[-]$	Difference $\Delta b^*[-]$	The Total Color Difference $\Delta E^*[-]$	Color Difference $\Delta C^*[-]$	Tone Difference (Shade) $\Delta H^*[-]$
0–1	1.208(b)	−5.031(c)	6.678(c)	14.110(b,d)	7.252(c)	4.586(a,b)
0–2	0.566(b)	−4.265(c)	2.662(b,c)	13.574(b,d)	3.180(b,c)	4.148(a,b)
0–3	−3.651(a)	3.689(a)	−16.217(a)	18.015(a,b)	−16.092(a)	5.585(b,c)
0–4	−3.804(a)	3.592(a)	−16.045(a)	17.650(a,b)	−15.926(a)	5.496(a,b,c)
1–2	−0.6429(b)	0.767(a)	−4.016(b)	8.304(d,e)	−4.071(b)	3.487(a,b)
1–3	−4.859(a)	8.720(b)	−22.895(a)	28.404(c)	−23.343(a)	9.583(e)
1–4	−5.012(a)	8.623(b)	−22.723(a)	25.029(a,c)	−23.178(a)	7.232(c,d)
2–3	−4.217(a)	7.954(b)	−18.879(a)	22.054(a,c)	−19.272(a)	7.577(c,d,e)
2–4	−4.370(a)	7.857(b)	−18.707(a)	24.169(a,c)	−19.106(a)	8.928(d,e)
3–4	−0.153(b)	−0.097(a)	0.172(b,c)	6.427(e)	0.166(b,c)	3.121(a)

a, b, c, d and e—groups of homogeneous variables.

with specific Table 2 and also added Tables 3 and 4

Table 2. The average values of the color parameters (L^* , a^* , b^*) and the total color difference ΔE^* for the tuber stimulation methods.

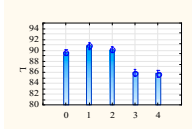

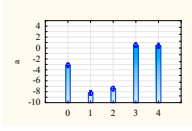

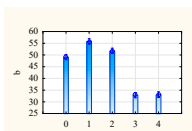



Parameters	Types of Stimulation	Mean Values of Parameters	Relationships of Parameters from Stimulation Modes	Types of Stimulation	Generated Product Colors for Average Values	Relationships	Total Color Difference ΔE^*
L^*	0	89.58		0		0-1	8.45
	1	90.79					
	2	90.15					
	3	85.93					
	4	85.78					
a^*	0	-3.17		1		0-2	5.06
	1	-8.20					
	2	-7.43					
	3	0.52					
	4	0.42					
b^*	0	49.11		2		0-3	17.03
	1	55.78					
	2	51.77					
	3	32.89					
	4	33.06					
	0			3		1-2	4.14
	1						
	2						
	3						
	4						
	0			4		1-3	24.98
	1						
	2						
	3						
	4						
	0					1-4	24.82
	1						
	2						
	3						
	4						
	0					2-3	20.92
	1						
	2						
	3						
	4						
	0					2-4	20.75
	1						
	2						
	3						
	4						
	0					3-4	0.25
	1						
	2						
	3						
	4						

Table 3. The average values of the color parameters (L^* , a^* , b^*) and the total color difference ΔE^* for the immersion conditions of the semi-finished products in water.

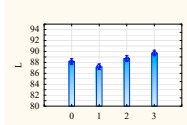

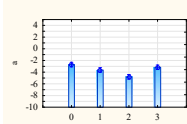

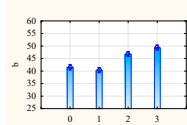


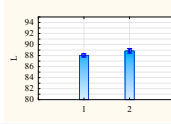

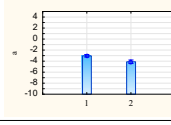

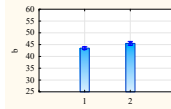

Parameters	Types of Stimulation	Mean Values of Parameters	Relationships of Parameters from Stimulation Modes	Types of Stimulation	Generated Product Colors for Average Values	Relationships	Total Color Difference ΔE^*
L^*	0	88.14		0		0-1 0-2 0-3 1-2 1-3 2-3	1.72 5.77 8.05 6.73 9.35 3.19
	1	87.21					
	2	88.71					
	3	89.72					
a^*	0	-2.70		1			
	1	-3.63					
	2	-4.80					
	3	-3.16					
b^*	0	41.49		2			
	1	40.38					
	2	46.83					
	3	49.38					
				3			

Table 4. The average values of the color parameters (L^* , a^* , b^*) and the total color difference ΔE^* for the point (spot) of color measurement on the French fries.

Parameters	Types of Stimulation	Mean Values of Parameters	Relationships of Parameters from Stimulation Modes	Types of Stimulation	Generated Product Colors for Average Values	Relationships	Total Color Difference ΔE^*		
L^*	1	88.03		1		1-2	2.42		
	2	88.86							
a^*	1	-3.03		2					
	2	-4.11							
b^*	1	43.52		2					
	2	45.52							

- (5) In order to be consistent with the new tables above, the authors replaced the table and data citations in main text:

According to Table 1, the color evaluation ratios of fries determined by the CIE $L^*a^*b^*$ method (ΔL^* , Δa^* , Δb^* , ΔE^* , ΔC^* , ΔH^*) were statistically significantly varied with

Conversely, the type of frying fat did not statistically significantly influence the parameters under study (Table 1).

- (6) Authors replaced the Table 2 and data citations in main text:

Differences in brightness (ΔL^*) were in the range of -5.012 to 1.208 (Table 2, Figure 1).

with

Analysis of French fries' color parameters after UV-C tuber stimulation indicated that lightness (L^*) ranged from 85.78 to 90.79 (Table 2). The lowest values were obtained for French fries produced from tubers stimulated before storage (3, 4) (85.78 , 85.93), while the highest values were observed for French fries prepared from tubers stimulated two days before processing (1, 2) (90.15 , 90.79). Lightness of control samples (unstimulated tubers) was at the level of 89.58 . The a value (color ranging from green to red) assumed values from 0.52 to -8.20 . The highest values (0.52 , 0.42) were noted for French fries produced from tubers stimulated before storage (3, 4) and the lowest (-7.43 , -8.20) for French fries made of tubers stimulated before processing (1, 2) (Table 2). The b value (from blue to yellow) ranged from 32.89 to 55.78 . The highest values (55.78 , 51.77) were noted for French fries cut from tubers stimulated prior to processing (1, 2) and the lowest (33.06 , 32.89) for French fries produced from tubers stimulated prior to storage (3, 4) (Table 2).

Thus, analysis of the color coordinates of the French fries showed that fries produced from tubers stimulated prior to processing were the lightest in color ($L^* = 90.15$, 90.79) with a significant predominance of yellowness ($b^* = 55.78$, 51.77) and slight admixture of greenness ($a^* = -7.43$, -8.20). French fries prepared from tubers stimulated prior to storage were the darkest in color (of all studied samples) ($L^* = 85.78$, 85.93), with the lowest yellowness component ($b^* = 33.06$, 32.89) and a trace of redness ($a^* = 0.52$, 0.42) (Table 2). The colors of French fries are described by the mean values of L^* , a^* , b^* ; coordinates for different stimulation modes are visualized in Table 2 as colors generated by Adobe Color CC software. The total color difference ΔE for all experimental combinations of tuber stimulation modes ranged from 0.25 to 24.98 . The lowest color difference was observed between stimulation modes 3–4 and was indistinguishable (invisible). The values obtained for the remaining relations indicate that there were distinct or large color differences between the experimental combinations (Table 2).

- (7) To clearly indicate the effect of UV-C on transformations of monosaccharides linked with flavonoids, the authors wish to supplement an explanation along with reference [21] and [27]:
21. Nawara, P.; Jakubowski, T.; Sobol, Z. Application of the CIE $L^* a^* b^*$ method for the evaluation of the color of fried products from potato tubers exposed to C band ultraviolet light. In *Progress of Mechanical Engineering Supported by Information Technology, Proceedings of the E3S Web of Conferences, XXII International Scientific Conference POLSITA 2019, Czajowice, Poland, 19–20 September 2019*; EDP Sciences: Les Ulis, France, 2019; Volume 132, doi:10.1051/e3sconf/201913202004.
27. Sobol, Z.; Jakubowski, T.; Wrona, P. The effect of UV-C stimulation of potato tubers and soaking of potato strips in water on density differences of intermediates for French-fry production. In *Contemporary Research Trends in Agricultural Engineering, Proceedings of the BIO Web of Conferences, Kraków, Poland, 25–27 September 2017*; EDP Sciences: Les Ulis, France, 2018; Volume 10, doi:10.1051/bioconf/20181002031.

The authors and the Editorial Office would like to apologize for any inconvenience caused to the readers by these changes. The change does not affect the scientific results. The manuscript will be updated and the original will remain online on the article webpage.

Reference

1. Sobol, Z.; Jakubowski, T.; Nawara, P. The Effect of UV-C Stimulation of Potato Tubers and Soaking of Potato Strips in Water on Color and Analyzed Color by CIE $L^* a^* b^*$. *Sustainability* **2020**, *12*, 3487. [[CrossRef](#)]



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