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SAMPLE RATING IN WATER-ALCOHOL TECHNOLOGY BY PROFILE NON-LINEAR QUALITY CRITERIA

Iryna Koretska,
Ph.D. in Technical Sciences,
National University of Food Technology,
Kyiv, Ukraine,
tac16@ukr.net
https://orcid.org/0000-0001-5680-5789

Oleh Kuzmin,
Ph.D. in Technical Sciences,
National University of Food Technology,
Kyiv, Ukraine,
kuzmin_ovl@ukr.net
https://orcid.org/0000-0001-9321-6684

Tetiana Zinchenko,
Ph.D. in Technical Sciences,
National University of Food Technology,
Kyiv, Ukraine,
zin.ta.vl@gmail.com
https://orcid.org/0000-0002-4828-2380

Topicality. Today, the restaurant technology product evaluation samples occurs organoleptic characteristics, in determining the average score calculation and subsequent tasting sheet. Important aspects of such evaluation are the collection, validation and comparison of the test specimens by organoleptic parameters. **Purpose and methods.** *The purpose of the article* is to create a mathematical model for the determination of rational recipe compositions based on water-alcohol infusions of vegetable raw materials for the technology of restaurant products. *The task of the research* was to substantiate the method of ranks with the use of sensory evaluation of samples of water-alcohol infusions in the restaurant products technology. **Results.** One aspect of the research is to compare samples with controls and with each other. For the effective evaluation of organoleptic indicators for the quality of infusions used the method of determining the quality criterion by profile, which covers a large number of indicators and is sensitive to changes in each of the descriptors used. The results were checked by the method of calculation of the complex quality criterion. **Conclusions and discussions.** When calculating the priority of samples, it is possible to use both the calculation of the complex quality criterion and the calculation of the quality criterion according to profiles that give identical results. The scientific novelty of the results obtained is to improve the use of the results of organoleptic evaluation of samples based on descriptors. The practical significance of the obtained results is manifested in the implementation of them in the work of competition commissions in the evaluation of the developed products relative to the possibility of determining the priority of samples.
Keywords: restaurant products, water-alcohol infusions, quality assessment, sample rating.

The topicality of the problem

Formulation of the problem. Today, the restaurant business faces the important task of satisfying the desires of consumers in quality products that have improved organ-

oleptic characteristics (Kanter et al., 2003a), which allows institutions to focus their efforts on shaping the quality of restaurant products (Kuzmin et al., 2017). This is possible due to innovative technologies, using modern methodologies, the latest mathematical apparatus (Dorokhovych et al., 2016).

One of the problems with the technology of restaurant products is the reliability of numerical values obtained from the organoleptic evaluation of quality indicators (Varakuta, 2004; Domanova & Shubina, 2014), especially in the expert evaluation of tasting sheets (Kanter et al., 2003b). Existing mathematical and statistical methods for processing expert assessments (Dorokhovych, 2016) (ranking method; direct estimation method; consistent advantages method; pairwise comparisons) allow to increase the reliability of organoleptic evaluation results (Kovalenko, 2012; Dietrich et al., 2017). Despite the considerable theoretical study of the problem, issues related to the processing of the information obtained to conduct a comprehensive independent evaluation need further research.

Purpose and research methods

The purpose of the article is to find a mathematical model of the organoleptic properties dependence on water-alcohol infusions of vegetable raw materials (Kuzmin et al., 2018) for the determination of rational recipe compositions in the technology of restaurant products (Kuzmin et al., 2016).

Research methods. To achieve this goal, we used the method of determining the quality criterion «quality polygon» (Koretska & Zinchenko, 2018).

Research methodology. A 10-point Quality Score was used to determine the descriptors. The total number of descriptors are 39 (5 is to characterize color and transparency; 17 is taste; 17 is aroma), taking into account the nature, intensity, order of manifestation and completeness of descriptors. Critical rating limit for Quality Score is 4 points (agreed by experts). Samples characterized by unsatisfactory taste were characterized as substandard, even by their corresponding appearance and aroma. In the first stage, experts (11 people) formed a list of organoleptic indicators and their components descriptors. In the second stage, the values of the organoleptic indicators in the scores were evaluated, as well as the values of a specific indicator is on the average of all descriptors of the group. By the average values of the selected quality criterion, all samples were evaluated and the most rated.

Research results

Analyzing the meanings of individual indicators, we evaluated (in points) descriptors by groups of individual indicators (Table 1). The final evaluation of a particular sample indicator was determined by obtaining the average of the individual descriptors used to calculate the average value of the main indicator («Color and Transparency», «Taste», «Flavor»).

During the analysis of the results obtained, it was found that the infusions samples were arranged (by the average score) as follows: the highest score was an infusion of "Vanilla", the second place was an infusion of "Strawberry", the third place was an infusion of "Rosemary", and in the fourth place there were at the same time three samples of infusions: "Carnation", "Honey" and "Lemon" (table. 2).

Table 1. Ranks of comparative indicators of water-alcohol extractsby groups of descriptors

№	Indicator (descriptor)	Ranks of comparative samples					
		Vanilla	**Rosemary**	**Carnation**	**Honey**	**Lemon**	**Straw-berry**
1	*Color and transparency*	*110,000*	*90,752*	*72,500*	*91,500*	*102,750*	*102,750*
2	Transparent	110	99	62	84	104	110
3	Pleasant	110	99	95	99	104	103
4	Bright	110	88	77	88	101	99
5	Light	110	77	56	95	102	99
6	*Taste*	*86,875*	*76,313*	*76,813*	*69,438*	*64,188*	*70,438*
7	Rum	95	66	44	110	44	70
8	Spirituous	83	81	100	48	96	87
9	Aftertaste	82	83	85	110	91	98
10	Pleasant	81	88	88	110	86	100
11	Harmonious	66	88	88	98	44	94
12	Soft	44	88	55	99	60	95
13	Bitter	110	44	110	48	55	46
14	Tart	110	44	94	44	45	44
15	Spicy	110	105	110	44	44	44
16	Saturated	110	109	96	83	99	95
17	Burning	110	110	103	44	44	44
18	Oily	88	110	80	44	44	44
19	Fresh	44	44	44	44	84	44
20	Sour	44	44	44	44	44	48
21	Sweet	110	73	44	97	44	75
22	Fruit	103	44	44	44	103	99
23	*Aroma*	*74,750*	*69,625*	*77,188*	*65,563*	*59,563*	*64,000*
24	Rum	110	44	44	109	89	91
25	Spirituous	44	44	44	44	81	78
26	Fruit	103	44	110	110	98	98
27	Spicy	110	110	110	44	44	44
28	Aromatic	110	110	110	44	46	44
29	Flower	44	110	110	87	44	82
30	Coniferous	44	44	65	44	44	44
31	Resinous	44	44	44	44	44	44
32	Herbal	110	106	110	44	44	44
33	Wood	44	44	80	44	46	44
34	Pleasant	110	44	97	110	85	93
35	Balanced	92	84	81	101	85	91
36	Expressed	99	108	92	89	71	95
37	Medicinal	44	90	50	44	44	44
38	Acute	44	44	44	47	44	44
39	Rough	44	44	44	44	44	44

Source: own development

Table 2. Determination of the samples rating of water-alcohol extracts of vegetable raw materials by organoleptic parameters

Indicator	The value of the comparative indicators of infusions, points					
	Vanilla	Rosemary	Carnation	Honey	Lemon	Strawberry
Color and transparency	110,000	90,752	72,500	91,500	102,750	102,750
Taste	86,875	76,313	76,813	69,438	64,188	70,438
Aroma	74,750	69,625	77,188	65,563	59,563	64,000
The total amount of points received	271,625	236,690	226,501	226,501	226,501	237,188
Average value	90,542	78,897	75,500	75,500	75,500	79,063
Sample rating, location	1	3	4	4	4	2

Source: own development

The most striking method is the visualization of the organoleptic properties of products in the form of profile grams, which can be used to assess the intensity, severity, difference of descriptors. The obtained values of the organoleptic parameters were used to determine the profile quality criterion (by profiles).

An important feature of this criterion is that samples are rejected (because of the established critical limit), in which at least one of the quality indicators has a false representation (characterized by a small value undesirable for the sample). The quality criterion in geometric interpretation determines the optimal variant of the product with the largest area of the polygon of quality, constructed using normalized dimensionless quality indicators.

The evaluation of the impact of vegetable raw materials on the quality of water-alcohol infusions was performed using the criterion in the form of the sum of the products of the component indicators fj. Comparison of different samples is possible if the quality criterion is used and the «quality polygon» (as the area of the polygon), which is calculated as the sum of the areas of the individual triangles formed by the rays of the individual quality indicators, with the central angle $2\pi/N$:

$$S = \sum_{j=1}^{N} \left(\frac{1}{2} \cdot f_j \cdot f_{j+1} \cdot sin \frac{2\pi}{N} \right), \quad \partial e \quad f_{N+1} = f_1 , \tag{1}$$

where f_j. – the meaning of a specific Quality Score, points;
N – number of samples.

Steel factors that do not depend on the current index of the sum j can be deduced from each application, after which the criterion formula takes the form:

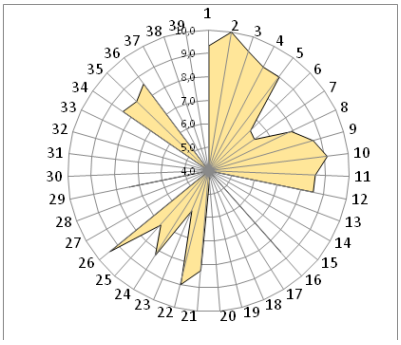
$$S = \frac{1}{2} sin \frac{2\pi}{N} \cdot \sum_{j=1}^{N} \left(f_j \cdot f_{j+1} \right) \text{, point}^2 \quad (2)$$

And for the comparison of several diverse specimens, the criterion S has the form:

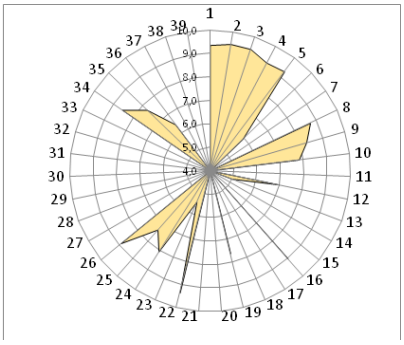
$$S = sin \frac{2\pi}{N} \cdot \sum_{j=1}^{N} \left(f_j \cdot f_{j+1} \right) \text{, point}^2 \quad (3)$$

Determining factors of importance (Boiko & Hrynevych, 2011) of selected indicators and their descriptors was performed by Delphi, expert method for each group as compared to the average values of the group descriptors provided that the sum of the team is 10 points.

Based on the results of the evaluation, quality profiles of individual samples were constructed using the method "quality polygon" (Fig. 1), and quality criteria (S2, points) were calculated for the presented samples (according to formula 3).



a



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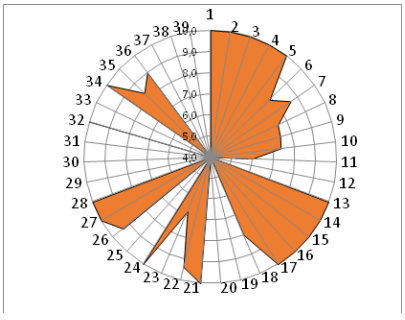

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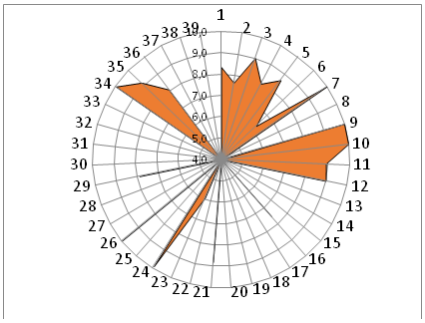

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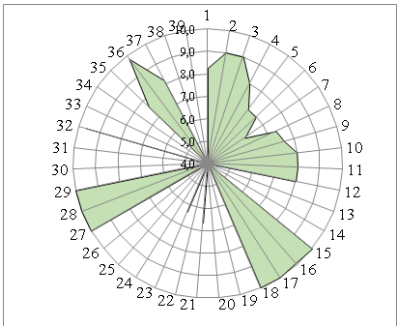

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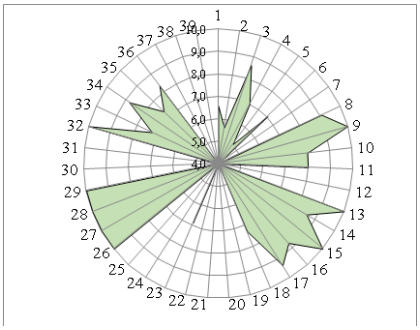

f

Fig. 1. Profile of quality indicators of samples of water-alcohol infusions of vegetable raw materials: a – rum infusion on strawberries; b – rum infusion of lemon peel; c – a rum infusion of vanilla; d – rum infusion on honey; e – rum infusion of rosemary; f – rum infusion on carnation;

1 – color and transparency: 2 – transparency; 3 – pleasant; 4 – bright; 5 – light; 6 – Taste: 7 – rum; 8 – alcohol; 9 – aftertaste; 10 – pleasant; 11 – harmonious; 12 is mild; 13 – bitter; 14 – tart; 15 – spicy; 16 – saturated; 17 – burning; 18 – oily; 19 – fresh; 20 – acidic; 21 – sweet; 22 – fruit; 23 – Fragrance: 24 – rum; 25 – alcohol; 26 – fruit (corresponding to raw material, fruit); 27 – spicy (corresponding to raw materials); 28 – fragrant; 29 – floral; 30 – coniferous; 31 – resinous; 32 – herbal; 33 – wood; 34 – pleasant; 35 – balanced; 36 – expressed; 37 – medical; 38 – acute; 39 – rough.

Source: own development

As it can be seen from the presented graphical profiles of the criterion "quality polygon", not all the presented samples have the same number of indicators (descriptors).

This can be explained by the fact that the presented samples, in our case, infusions of vegetable raw materials, made using different plant raw materials and therefore have specific individual indicators (descriptors) that are inherent in one or the other representatives of the flora, which do not have any descriptors at all.

The calculation of the profile quality criterion was performed by comparing the S parameters with the following linear approximation of the partial criteria dependencies (Fig. 2).

The analysis of the obtained results made it possible to rank the samples of infusions (by quality criterion). Vanilla was the highest, while Rosemary was second; third place was strawberry infusion, fourth place was Carnation infusion, fifth place was Honey infusion and sixth place was Lemon infusion.

During the evaluation of organoleptic quality indicators of samples of water-alcohol infusions, the values of individual descriptors (in points) were monitored. Scientific research has substantiated the means that provide reliable results in assessing the consistency of expert judgment. Such means, in particular, are the Spearman or Kendall rank correlation coefficients.

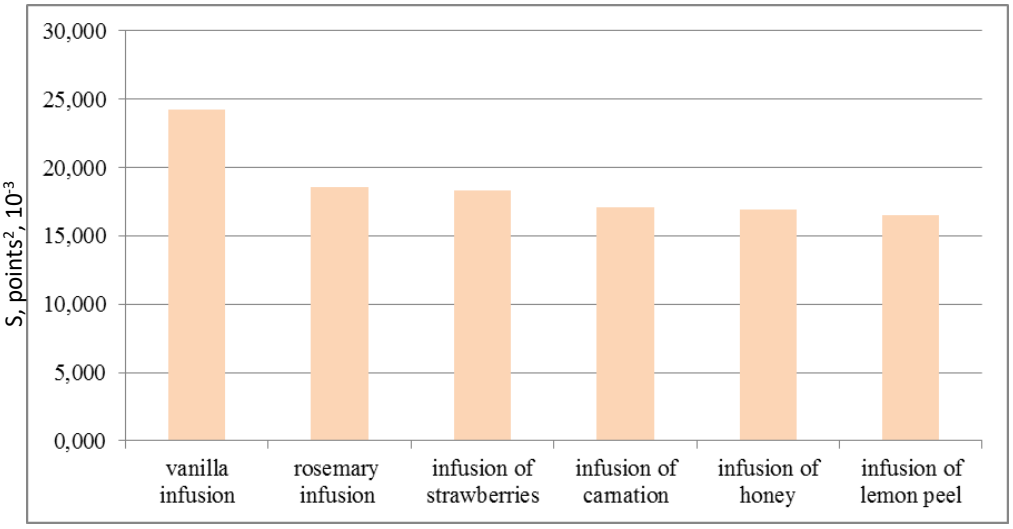

Fig. 2. The distribution of values of criterion of quality of prototypes infusions on the results of selected profile grams
Source: own development

We assume that such issues should have equal weight in a number of problems. Therefore, it is advisable to use an a priori ranking that gives equal rank to issues of equal importance. Using rankings, individual metrics are ranked in order of decreasing their impact on the final result (diminishing importance, priority or superiority). To confirm the expertise of each expert and a sufficient degree of consistency of experts, rank statistical methods were used to study the correlation between the benchmarks (or selected as the best) and the indicators of each expert. Spearman's rank correlation coefficient was used to evaluate the degree of correlation.

To calculate the rank correlation coefficients, the indicators were arranged in order of decreasing points, after which they were numbered from 1 to 36. If in the aggregate (accepted as «E») met values with the same values, their ranks were calculated as the arithmetic mean of their numbers in descending order. The obtained numbers (numbers) are indicators' ranks X_i totality E: X_1, X_2, ... X_{36}. To assign rankings to Expert A's scores, items were arranged in order of decreasing their scores and numbered. The rank value is equal to the number of the element corresponding to the element of the set E.

The calculation of ranks for the selected (first) expert on the example of the sample "Vanilla" is presented in table. 3.

Table 3. The values of the indicators ranks for the aggregates E (X_i) and A (Y_i)

№	1	2	...	15	16	17	18	19	20	21	22	23	24	25	26	27	...	35	36
X_i	8	8	...	8	16.5	16.5	18	19	20	21	22	23	24	25	31	31	...	31	31
Y_i	9	9	...	9	9	9	20.5	20.5	19	24	18	22	23	25	31	31	...	31	31
$\|d_i\|$	1	1	...	1	7.5	7.5	2.5	1.5	1	3	4	1	1	0	0	0	...	0	0

Source: own development

Spearman's rank correlation coefficient was determined by the formula (Kovalenko, 2012):

$$r_s = 1 - 6\sum_{i=1}^{36} d_i^2 \Big/ (n^3 - n), \; d_i^2 = |d_i|^2 = (X_i - Y_i)^2. \tag{4}$$

If there are related rankings (for groups with the same metric values), Spearman's rank correlation coefficient was determined using the refined formula:

$$r_s = 1 - \frac{\sum_{i=1}^{36} d_i^2}{\frac{1}{6}(n^3 - n) - (T_x - T_y)}, \tag{5}$$

$$T_x = \frac{1}{12}\sum_{j=1}^{m_x}(t_x^3 - t_x), \quad T_y = \frac{1}{12}\sum_{j=1}^{m_y}(t_y^3 - t_y), \tag{6}$$

where m_x, m_y – the number of expert groups that do not differ in rank in sets E and A;
t_x, t_y – the number of ranks in a group of unclassified ranks;
d_i – the difference between the ranks of the two variables.

Further calculations were performed according to the table. 3 and obtained the results:

$$\sum_{i=1}^{36} d_i^2 = 164 \;, \quad m_x = 3, \quad m_y = 3 \;, \tag{7}$$

$$T_x \approx 390.5, \quad T_y = 518.5 \;,$$
$$r_s \approx 1 - 0.024 \approx 0.976 \;.$$

Analyzing the calculations, we can conclude that the obtained value of the Spearman correlation coefficient is close to 1. This means that the expert's estimates of the quality indicators and the benchmarks are fairly tight. Ranks for other tasting participants were also calculated. Since for all experts correlation coefficient values are close to 1:, the work of the expert group can be considered coherent. The product rating was calculated by organizing an appropriate expert survey to identify individual indicators and their descriptors, which were carried out in two stages.

Determining the priority (rating) of the obtained samples (Table 4) is possible provided that the coefficients of weight (on a 10-point scale) are used and the main indicators are converted into rating values.

$$P = \sum_{i=1}^{n}(m_i p_i), \tag{8}$$

m_i – the meaning of weight factor, score;
p_i – the meaning of the main indicator, score.

Tab. 4. Determination of the samples rating of infusions

Indicator	Weighting ratio, units	Ranks of comparisons of infusions with selected raw materials					
		Vanilla	Rosemary	Carnation	Honey	Lemon	Strawberry
Color and transparency	3	330,000	272,250	217,500	274,500	308,250	308,250
Taste	4	347,500	305,250	307,250	277,750	256,750	281,750
Aroma	3	224,250	208,875	231,563	196,688	178,688	192,000
Sample rating, points[2]		901,750	786,375	756,313	748,938	743,688	782,000
Sample rating, (ordinal position)		1	2	4	5	6	3

Source: own development

When compiling a rating list of test samples (Table 5), different non-linear methods can be selected, such as the calculation of the «quality criterion» and the proposed calculation of the rating, which give identical results.

One of the important aspects of scientific research is the comparison of the obtained final indicators of the quality criterion of the samples using different methods of verification of the obtained results.

Using the method of determining the quality criterion by profiles (formula 3), we obtain the following rating series (the order of distribution of results by the best value): 1 is vanilla; 2 is rosemary; 3 is carnation; 4 is honey; 5 is lemon; 6 is strawberries. The meanings of this rating series were confirmed by the method of calculation of the complex quality criterion (formula 4).

Table 5. Determination of priority of infusions samples

Indicator	The value of comparative indicators of infusions with selected raw materials					
	Vanilla	Rosemary	Carnation	Honey	Lemon	Strawberry
By arithmetic calculation						
Total points, score	271,625	236,690	226,501	226,501	226,501	237,188
Average meaning, score	90,542	78,897	75,500	75,500	75,500	79,063
Rating 1 (ordinal position)	1	3	4	4	4	2
By the nonlinear criterion of the quality profile						
Quality criterion, $S10^{-3}$, score[2]	24,273	18,557	17,094	16,905	16,538	18,321
Rating 2 (ordinal position)	1	2	4	5	6	3
By complex Quality Score (ranking determination)						
Sample rating, score	901,750	786,375	756,313	748,938	743,688	782,000
Rating 3 (ordinal position)	1	2	4	5	6	3

Source: own development

The calculations showed the identity of the results when using the proposed methods in determining the rating (the order priority) of prototypes of water-alcohol infusions, and this means that they are legitimate.

Conclusions and discussion of results

The results of the studies allow us to confirm the feasibility of using sensory analysis and to reach such conclusions:

– when calculating the priority of prototypes, it is possible to use both the calculation of the definition of the complex quality criterion and the calculation of the quality criterion according to profiles that give identical results;

– scientific novelty of the obtained results is to determine the regularity of the processes of organoleptic evaluation of samples based on descriptors;

– the practical significance of the obtained results is manifested in their implementation in the work of competition commissions during the evaluation of the developed products for the possibility of determining the priority of samples;

– prospects for further scientific work to create a system of integrated sample evaluation.

REFERENCES

Boiko, T., & Hrynevych, B. (2011). Otrymannia koefitsiientiv vahomosti dlia kilkisnoi otsinky yakosti produktsii za skladovymy nepevnosti otsiniuvannia [Obtaining weights for the quantitative assessment of product quality by the components of uncertainty of estimation]. *Vymiriuvalna tekhnika ta metrolohiia, 72*, 111–116 [in Ukrainian].

Dietrich, I., Kuzmin, O., & Mikhailenko, V. (2017). Comprehensive evaluation of the hot sweet souffle dessert quality. *Ukrainian Journal of Food Science*, *5*(1), 92–102. https://doi.org/10.24263/2310-1008-2017-5-1-12 [in English].

Domanova, E. V., & Shubina, L. Iu. (2014). Vliianie modifitcirovannykh kolbasnykh obolochek na sensornye kharakteristiki kolbas [The effect of modified sausage casings on the sensory characteristics of sausages]. *Tekhnika i tekhnologiia pishchevykh proizvodstv, 2*(33), 45–49 [in Russian].

Dorokhovych, A. M., Dorokhovych, V. V., & Zinchenko T. V. (2016). *Optymizatsiia tekhnolohichnykh protsesiv haluzi [Optimization of technological processes of the industry].* INKOS [in Ukrainian].

Kantere, V. M., Matison, V. A., & Fomenko, M. A. (2003a). *Sensornyi analiz produktov pitaniia [Sensory Food Analysis]* [Monograph]. Tipografiia RASKhN [in Russian].

Kantere, V. M., Matison, V. A., Fomenko, M. A., & Kriukova, G. V. (2003b). Osnovnye metody sensornoi otcenki produktov pitaniia [The main methods of sensory assessment of food]. *Pishchevaia promyshlennost*, *10*, 6–13 [in Russian].

Koretska, I., & Zinchenko, T. (2018). Evaluation of research samples by nonlinear quality criteria. In *World Science in 2018: Results,* Proceedings of II International Scientific Conference (pp. 22–26). Lulu Press [in English].

Kovalenko, I. P. (2012). *Matematychna statystyka u prykladakh i zadachakh [Mathematical statistics in examples and problems].* Vydavnychyi Dim "Slovo" [in Ukrainian].

Kuzmin, O., Kovalchuk, Y., Velychko, V., & Romanchenko, N. (2016). Improvement technologies of aqueous-alcoholic infusions for the production of syrups. *Ukrainian Journal of Food Science*, *4*(2), 258–275. https://doi.org/10.24263/2310-1008-2016-4-2-8 [in English].

Kuzmin, O., Levkun, K., & Riznyk, A. (2017). Qualimetric assessment of diets. *Ukrainian Food Journal*, *6*(1), 46–60. https://doi.org/10.24263/2304-974X-2017-6-1-7 [in English].

Kuzmin, O., Zubkova, V., Shendrik, T., Korenets, Y., Kuzmin, A., & Bilenkyi P. (2018). Internal mechanisms for establishment of the equilibrium state of water-alcohol mixtures in vodka technology. *Ukrainian Food Journal*, *7*(4), 655–670. https://doi.org/10.24263/2304-974X-2017-6-1-10 [in English].

Varakuta, S. A. (2004). *Upravlenie kachestvom produktcii [Product quality management]*. Izdatelstvo RIOR [in Russian].

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Ірина Корецька,
кандидат технічних наук,
Національний університет харчових технологій,
Київ, Україна,
tac16@ukr.net
https://orcid.org/0000-0001-5680-5789

Олег Кузьмін,
кандидат технічних наук,
Національний університет харчових технологій,
Київ, Україна,
kuzmin_ovl@ukr.net
https://orcid.org/0000-0001-9321-6684

Тетяна Зінченко,
кандидат технічних наук,
Національний університет харчових технологій,
Київ, Україна,
zin.ta.vl@gmail.com
https://orcid.org/0000-0002-4828-2380

РЕЙТИНГ ЗРАЗКІВ У ТЕХНОЛОГІЇ ВОДНО-СПИРТОВИХ НАСТОЇВ ЗА ПРОФІЛЬНИМ НЕЛІНІЙНИМ КРИТЕРІЄМ ЯКОСТІ

Актуальність. На сьогодні у технології ресторанної продукції оцінювання зразків відбувається за органолептичними показниками, при визначенні середнього балу і подальшому розрахунку дегустаційного листа. Важливими аспектами такої оцінки є збір, перевірка та порівняння досліджуваних зразків за органолептичними показниками. **Мета і методи.** *Метою роботи* є створення математичної моделі для визначення раціональних рецептурних композицій на основі водно-спиртових настоїв рослинної сировини для технології ресторанної продукції. *Завданням дослідження* було обґрунтування методу рангів із застосуванням сенсорного оцінювання зразків водно-спиртових настоїв у технології ресторанної продукції. **Результати.** Одним з аспектів дослідження є порівняння зразків із контролем та між собою. Для ефективного оцінювання органолептичних показників на якість настоїв використовували метод визначення критерію якості за профілограмами, який охоплює значну кількість показників і є чутливим до зміни кожного з використаних дескрипторів. Результати перевіряли методом розрахунку комплексного критерію якості. **Висновки і обговорення.** Під час розрахунку пріоритетності зразків можна використовувати як розрахунок комплексного критерію якості, так і розрахунок критерію якості за профілограмами, які дають ідентичні результати. Наукова новизна отриманих результатів полягає у вдосконаленні використання результатів органолептичного оцінювання зразків на основі дескрипторів. Практичне значення отриманих результатів проявляється у впровадженні їх у роботі конкурсних комісій при оцінці розробленої продукції відносно можливості визначення пріоритетності зразків.

Ключові слова: ресторанна продукція, водно-спиртові настої, оцінка якості, рейтинг зразків.

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Ирина Корецкая,
кандидат технических наук,
Национальный университет пищевых технологий,
Киев, Украина,
tac16@ukr.net
https://orcid.org/0000-0001-5680-5789

Олег Кузьмин,
кандидат технических наук,
Национальный университет пищевых технологий,
Киев, Украина,
kuzmin_ovl@ukr.net
https://orcid.org/0000-0001-9321-6684

Татьяна Зинченко,
кандидат технических наук,
Национальный университет пищевых технологий,
Киев, Украина,
zin.ta.vl@gmail.com
https://orcid.org/0000-0002-4828-2380

ОПРЕДЕЛЕНИЕ РЕЙТИНГА ОБРАЗЦОВ В ТЕХНОЛОГИИ ВОДНО-СПИРТОВЫХ НАСТОЕВ ПО ПРОФИЛЬНОМУ НЕЛИНЕЙНОМУ КРИТЕРИЮ КАЧЕСТВА

Актуальность. Сегодня в технологии ресторанной продукции оценивание образцов происходит по органолептическим показателям, при определении среднего балла и дальнейшего расчета дегустационного листа. Важными аспектами такой оценки являются сбор и последующая проверка и сравнение исследуемых образцов по органолептическим показателям. **Цель и методы.** *Целью работы* является создание математической модели для определения рациональных рецептурных композиций на основе водно-спиртовых настоев растительного сырья для технологии ресторанной продукции. *Задачей исследования* было обоснование метода рангов с применением сенсорного оценивания образцов водно-спиртовых настоев в технологии ресторанной продукции. **Результаты.** Одним из аспектов исследования является сравнение образцов с контролем и между собой. Для эффективного оценивания органолептических показателей на качество настоев использовали метод определения критерия качества по профилограммам, который охватывает значительное количество показателей и является чувствительным к изменению каждого из использованных дескрипторов. Результаты расчета проверяли методом расчета комплексного критерия качества. **Выводы и обсуждение.** Во время расчета приоритетности образцов можно использовать как расчет комплексного критерия качества, так и расчет критерия качества по профилограммам, которые дают идентичные результаты. Научная новизна полученных результатов заключается в совершенствовании использования результатов органолептического оценивания образцов на основе дескрипторов. Практическое значение полученных результатов проявляется во внедрении их в работе конкурсных комиссий при оценке разработанной продукции относительно возможности определения приоритетности образцов.

Ключевые слова: ресторанная продукция, водно-спиртовые настои, оценка качества, рейтинг образцов.