THE USE OF NON-TRADITIONAL RAW MATERIALS IN THE TECHNOLOGY OF WHIPPED DESSERT [1]

Daryna Yurchenko, Student / Young Scientist
Department of Technology of Restaurant and Ayurvedic Products
Faculty of Hotel, Restaurant and Tourism Business
National University of Food Technology
Phone: +380677857944
E-mail: darindar27@gmail.com

Polovyk Volodymyr, Adjunct Lecturer.
Department of Technology of Restaurant and Ayurvedic Products
Faculty of Hotel, Restaurant and Tourism Business
Phone: +380930201889
E-mail: vovapolevik16@ukr.net

Iryna Koretska,Ph.D. in Technical Sciences,
Department of Technology of Restaurant and Ayurvedic Products
Faculty of Hotel, Restaurant and Tourism Business
National University of Food Technology,
Phone: +380505468376
E-mail: tac16@ukr.net

Abstract: The presented technology of desert with the addition of shavnat, will bring this product closer to the ideal, ie it will meet the daily human need for protein. Researched a new nontraditional cuiture- shavnat. Organoleptic analysis of the finished product showed that the use of shavnat puree gives the product a natural soft green color, the taste of the additive is not saturated, the consistency of the product is homogeneous. The positive influence of vegetable raw materials on organoleptic and physicochemical indicators of marshmallow quality has been established. Because the addition of sorrel to the innovative recipe allows to increase the content of digestible protein and has a positive effect on the organoleptic characteristics of the dessert.
Keywords: *Desert , Biologically active substances, Model, Complex, Evaluation.*

INTRODUCTION

Today, the restaurant technology product evaluation samples occurs organoleptic characteristics, in determining the average score calculation and subsequent tasting sheet. (Kuzmin, O., Levkun, K., & Riznyk, A., 2017). So we decided to create a dessert that is not only delicious, but also low in calories.

The object of research is a dessert with the addition of vegetable puree. We determined the optimal ratio by the method of experimental research (Koretska, I., & Zinchenko, T., 2018). apple puree and shavnat puree for this dessert. The analysis of physicochemical, organoleptic and technological indicators by standard methods was also carried out (Dorokhovych, A.,M., & Kovbasy, V., M., 2015).

One of the most pressing problems of the world's population is the problem of overcoming the lack of protein in the body. Human diseases are the result of such an unbalanced diet. It is worth noting that the products consumed by the population are mostly high in calories and unbalanced in terms of nutrients, which is mainly due to the presence of simple carbohydrates, fats compared to low levels of dietary fiber, minerals and vitamins.

[1] Докладът е представен на студентската научна сесия на наукової конференції «Хімічні технології“ 28.05.2020 в секция «Біотехнології та технології зберігання“ с оригинално заглавие на български език: “The use of non-traditional raw materials in the technology of whipped dessert mass”.

PRESENTATION

Improving the technology of new dishes or products usually involves the introduction of innovative ingredients in the recipe of a new dish and is an important step to study the technological impact and determine the effect of dosing a new food additive on a product made by traditional technology. (Kuzmin, O., Levkun, K., & Riznyk, A. 2017).

Thus, we believe that the development of technology of fruit and berry and fruit and vegetable desserts of a given consistency with a high content of biologically active substances, high organoleptic characteristics is relevant. Such dishes will significantly enrich the human diet with biologically active substances, dietary fiber, improve the organoleptic characteristics of dishes and the quality of food in general and provide the population with products from natural fruits, berries and berries.

The development of innovative dessert technology is aimed at maximizing the main goal of obtaining products enriched with biologically active substances with high quality, compared to desserts made by traditional technology.

The presented technology of dessert with the addition of shavnat, will bring this product closer to the ideal, ie it will meet the daily human need for protein.

To compare the protein and dietary fiber content of shavnat with other food groups, I performed an analysis. According to the analysis, in the first place in terms of protein content is chavnat, in second place - beans, then oat bran and whey, the least in fruit.

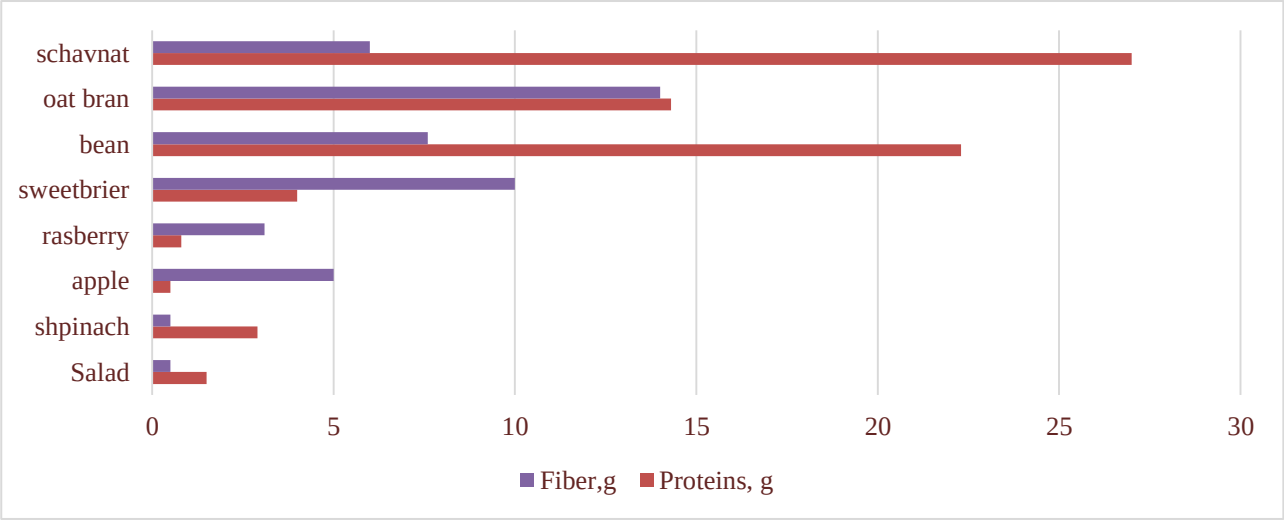


Fig. 1 Analysis of the chemical composition of vegetable raw materials

Source: own development

It is necessary to prepare semifinished product syrup made of sugar molasses and agar according to the recipe to boil at a temperature 95...98 degrees to get content of dry matter 84...85% to put 15% of shchavnat as a applesauce and to churn the mass in blender to get the mass which holds a shape.

Calculated mathematical modelling was used to study the composition of products enriched with natural additives with high-quality parameters. The quality criterion was chosen as the maximum total value of biologically active substances - vitamins and minerals.

For each pair of ingredients (apple or vegetables puree A: B), were calculated characteristics for a model percentage with a step of 5%.

Table 1. **Modeling of the composition of blended pairs**

Components	**Number of main components in a blended pair**									
Apple (A), %	70	0	30	35	40	45	50	55	60	65
Vegetables raw (B), %	0	70	40	35	30	25	20	15	10	5

Source: own development

Source: own development

The task of optimizing the formulations of products was to select the components and determine their ratios, which provide the maximum approximation of the mass fraction of nutrients to the standards. Based on this principle, indicators are generated that allow to evaluate the composition of the biologically active substances and its balance in the modelling product.

The choice of the best ratio in steam was influenced by the limit on the maximum total content of organic acids, which accelerate the absorption of protein.

The analysis of the characteristics of the selected pair of ingredients and the justification for choosing the best option according to the selected quality criterion was performed as a calculation of an array of data - a set of values of the quality criterion, depending on the quantitative ratio of the components in the pair of ingredients.

Thus, for the blended pair "apple - banana puree", was formed the vector of components from the innovative product (m=2: A-30%, B-40%).

$$\vec{x} := \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{pmatrix} = \begin{pmatrix} \frac{30}{100} \\ \frac{40}{100} \\ \frac{15}{100} \\ \frac{1.5+5+8.5}{100} \end{pmatrix}^T ; \qquad (1) \qquad \vec{x} = \begin{pmatrix} 0.3 \\ 0.4 \\ 0.15 \\ 0.15 \end{pmatrix}^T , \qquad (2)$$

where xk(k=1, 2, 3, 4) - components (in parts) of the formulation of a new product, namely x1 - amount of apple puree (in parts), x2 -amount of other puree (in parts), x3 - amount of sugar (in parts), x4 -amount of gelatin, egg white and water (in parts).

Complied condition: x1+x2+x3+x4=1.

The quantitative ratio of the main ingredients Cm was defined as:

$$c_m = \frac{x_1(m)}{x_2(m)}, \qquad (3)$$

where x1(m)+x2(m)=0,7 (constant value in this research), M -nodal point number. The set of nodal points is shown in the table 2.

Table 2 The calculated ratio of the content of the main components in the blended pair

Step	**The ratio of the components in the blended pair**								
	1	2	3	4	5	6	7	8	9
$x_1(m)$ (in parts)	0.0	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65
$x_2(m)$ (in parts)	0.70	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05
C_m	0.0	0.75	1.0	1.33	1.8	2.5	3.67	6.0	13.0

Source: own development

The Mathcad computer system was used to calculate the values of quality criteria.

The calculations took into account the data on the content of essential amino acids in the individual components of the innovative dessert and were taken into account in the development / creation of a new dessert.

Dessert zephyr, made by traditional technologies, contain up to 15% protein, but they mostly have an insufficiently balanced amino acid composition. The amount of substituted amino acids in sshavnat is 14964 mg per 100 g of dry matter of schavnat; irreplaceable - 10117 mg / 100 g; that is, essential amino acids make up 40.33% of the total number of amino acids. Analysis of the biological value of oxalic proteins by the SCOR method showed that the protein is almost balanced, the amino acid isoleucine (75% SCOR) is limited. The content of arginine and histidine is, respectively, 1301 mg and 779 mg per 100 g of dry matter of shavnat.

Table 3. **Amino acid composition of schavnat**

Name of essential amino acids (EAA)	**Quantity on protein**	
	Chicken egg protein	**Schavnat protein**
Valine	5,0	4,5
Isoleucine	4,0	3,0
Leucine	7,0	7,63
Lysine	5,5	6,44
Methionine	3,5	4,0
Threonine	4,0	4,0
Phenylalanine+ Tyrosine	6,0	10,26
Tryphtophan	1,0	0,9
Total part of EAA	36	40,73

Source: own development

It necessary to form zephyr with a pastry syringe. The formed portions of semispherical zephyr need to be put to let it rest and to get dry at a temperature 18...20 degrees.

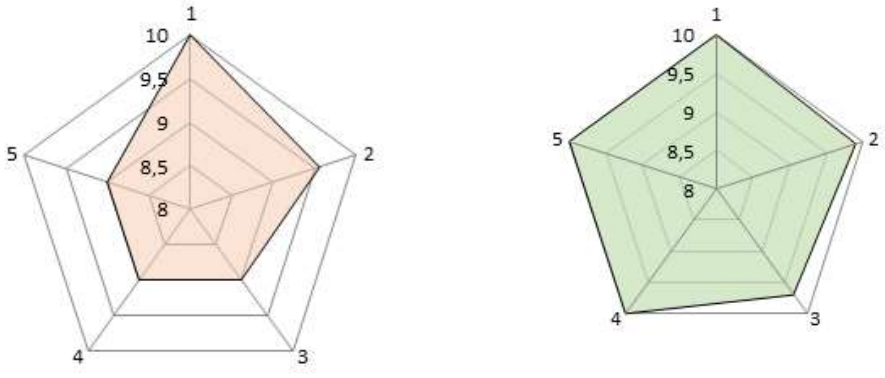
And for the comparison of several diverse specimens, the criterion S has the form:

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

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

N – number of samples.

The quality profiles of the new desserts are presented below:



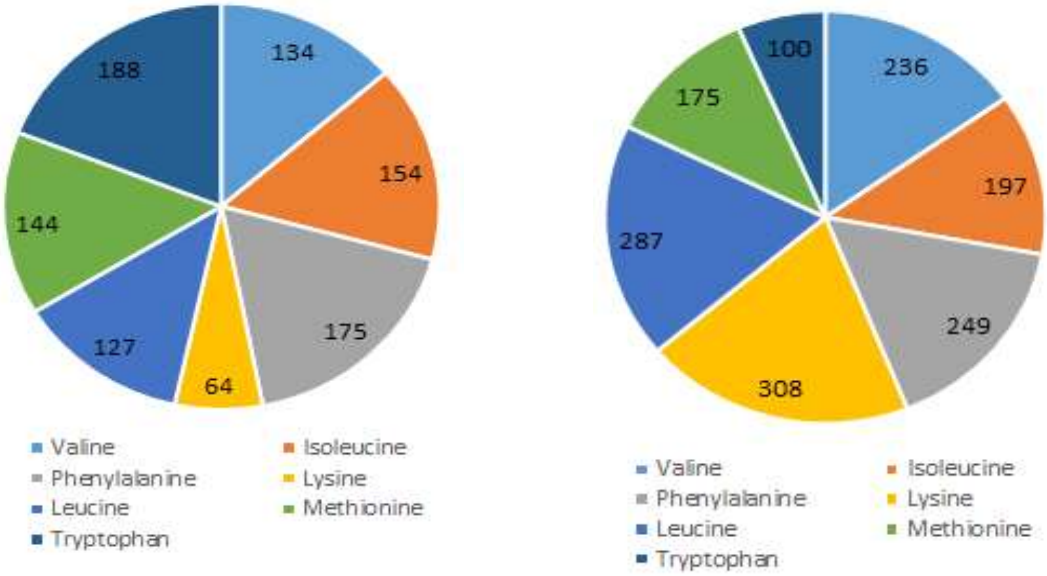
Traditional dessert, S =434 σ^2 Dessert with Shavnat, S = 492 σ^2

Fig. 1. Profile of quality indicators samples of desserts

де: 1 - Taste; 2- Арома; 3- consistency; 4- Color; 5- Form
Source: own development

The addition of sorrel to the innovative recipe allows to increase the content of digestible protein and has a positive effect on the organoleptic characteristics of the dessert.

Organoleptic analysis of the finished product showed that the use of shavnat puree gives the product a natural soft green color, the taste of the additive is not saturated, the consistency of the product is homogeneous.



a - In classic zephyr,% b - In ephyr with shchavnat,%

the amount of amino-acids in 100 grams

Fig. 2 **- Classic Zephyr's Amimo-acid score and zerphyr's with shchsvnat amino-acid score**
Source: own development

Based on the results of comparing the amino acid composition of the studied products, it is possible to draw a conclusion about the increase in the content of amino acids.

CONCLUSION

Shchavnat is a rich source of both protein and dietary fiber, in addition, it is rich in various trace elements, so to increase the nutritional value and enrich the human diet, it is advisable to use shchatny, which will improve organoleptic characteristics and quality of food in general, enrich biologically active substances, dietary fiber, amino acids and other essential substances.

The cost of traditional zefir and new ones is calculated and estimated. The analysis showed that the cost of zehpyr with shavnat more profitable. Thus, the proposed technology takes place in the modern food technology market of the world.

REFERENCES

1. . Koretska, I., & Zinchenko, T. (2018). Evaluation of research samples by nonlinear quality criteria. *World Science in 2018: Results: proceedings of II International scientific conference* (22-26). Morrisville, USA.

2. Koretska, I., Kuzmin, O., & Zinchenko, T. (2020). Sample rating in water-alcohol technology by profile non-linear quality criteria. *Restaurant and hotel consulting. Innovations*. That book 3, №1 (june, 2020).

3. Koretska, I., Zinchenko, T. & Polovyk,V. *(2020)* Determination of the optimum concentration of the fruit component in desserts. In the book. "The proceedings of mater. Int. nauchno-prakt. Conf. "Actual problems and modern technologies of food production" Kutaisi, 2020, p. 402 P. 269-274**.** ***(Оригинално заглавие***: Определение оптимальной концентрации

фруктового компонента в десертах. В кн. «Сборник трудов по матер. Межд. научно-практ. конф. . «Актуальные проблемы и современные технологии производства продуктов питания» Кутаиси, 2020, с. 402 С. 269-274.)

4. 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. (DOI: 10.24263/2310-1008-2016-4-2-8).

5. Kuzmin, O., Levkun, K., & Riznyk, A. (2017). Qualimetric assessment of diets. *Ukrainian Food Journal*, 6 (1), 46-60. (DOI: 10.24263/2304-974X-2017-6-1-7).

6. Znyzhennia vmistu patohennykh mikroorhanizmiv. Systemy analizu ryzykiv i vyznachennia krytychnykh kontrol'nykh tochok (NASSR). Kodeks federal'nykh rozporiadzhen'(CFR) Departamentu sil's'koho hosp-va SShA// Ofits. per. 9-ho vyd. Federal'noho reiestru [Tekst] / M.: Ros. Predstavnytstvo SShA z eksportu moloka, 2004. ***(Оригинално заглавие***: Зниження вмісту патогенних мікроорганізмів. Системи аналізу ризиків і визначення критичних контрольних точок (HACCP). Кодекс федеральних розпоряджень(CFR) Департаменту сільського госп-ва США// Офіц. пер. 9-го вид. Федерального реєстру [Текст] / М.: Рос. Представництво США з експорту молока, 2004.)

7. Krapivnitska I. A. & Voinov S. N. (2004). An important direction in the modern canning industry//food.– 2004.–№2.– P. 28**. *(Оригинално заглавие***: Крапивницька И.А., & Воинова С.Н. Важное направление в современной консервной промышленности//Продукты питания.– 2004.–№2.– С.28.)

8. Dorokhovych, A.,M., & Kovbasy, V., M. (2015). Tekhnolohiia ta laboratornyj praktykum kondyters'kykh vyrobiv i kharchovykh kontsentrativ : navch. posib. / za red. prof. A.M. Dorokhovych & V.M. Kovbasy. — K.:Firma "INKOS", 2015. — 36-41**. *(Оригинално заглавие*** Технологія та лабораторний практикум кондитерських виробів і харчових концентратів : навч. посіб. / за ред. проф. А.М.Дорохович і проф. В.М.Ковбаси. — К.:Фірма "ІНКОС", 2015. — 36-41.)