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QUALIMETRIC EVALUATION OF SENSORY PROPERTIES OF ACIDOPHILIC-WHEY ICE CREAM WITH OAT BETA-GLUCAN

КВАЛІМЕТРИЧНА ОЦІНКА ОРГАНОЛЕПТИЧНИХ ВЛАСТИВОСТЕЙ МОРОЗИВА АЦИДОФІЛЬНО-СИРОВАТКОВОГО З БЕТА-ГЛЮКАНОМ ВІВСА

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Анотація. *У статті проведено кваліметричну оцінку органолептичних властивостей розробленої композиції морозива. Автори використовували спеціальну методику дослідження органолептичних властивостей морозива. Органолептичну оцінку проводила комісія у складі 10 осіб з числа науково-педагогічних працівників та аспірантів кафедри технології молока та молочних продуктів в умовах, що відповідають вимогам стандарту оцінки. Отримані дані підтверджують доцільність застосування бета-глюкану вівса на рівні 0,75 %, що корелює з функціонально-технологічними властивостями морозива та забезпечує найвищий рівень органолептичних показників.*

Ключевые слова: *кваліметричний метод, β-глюкан, кисломолочне морозиво, коефіцієнт поправки, коефіцієнт вагомості.*

Abstract. *In this study, it was carried a qualimetric assessment of the organoleptic properties of the developed composition of ice cream. The authors used special method for studying the organoleptic properties of ice cream. Organoleptic evaluation was conducted by a commission of 10 people from among scientific, research and teaching staff and postgraduates of the Milk and Dairy Products Technology Department in conditions that meet the requirements of the evaluation standard. The obtained data confirm the expediency of applying oat beta-glucan at the level of 0.75 %, which correlates with the functional and technological properties of ice cream and provides the highest indicators of organoleptic perception.*

Key words: *qualimetric method, β-glucan, sour milk ice cream, correction factor, importance factor.*

Introduction.

The popularity of low-calorie ice cream production in the world is growing at a steady pace every year, due to changes in traditional eating habits and the shift of the vector towards an active lifestyle [1]. This approach forces food producers to look for new ways to develop new and improve existing products that meet the needs of consumers, but at the same time have high technological performance. Low-calorie ice cream production has a number of limiting factors to achieve a technological effect, namely the presence of "watery taste" [2], low overrun and resistance to melting in the absence of regulated dry matter content (25… 35%), coarse-grained structure that makes it impossible to maintain stable product during storage [3]. The use of natural functional and technological additives of plant origin, in particular oat beta-glucan, in the technology of ice cream is able to eliminate the above defects of ice cream [4]. At the previous stage of the scientific experiment, a recipe for acidophilic whey ice cream with the addition of oat beta-glucan was developed, which significantly improves the physicochemical parameters of the product.

Development and research of methods of organoleptic evaluation of food products allows to obtain products with predetermined properties that take into account not only the preferences of potential consumers, but also the physico-chemical characteristics of the product. In highly competitive market conditions, consumer assessment of organoleptic indicators plays a key role in product marketing.

Main part.

The mass fraction of guar gum in ice cream was at the level of 0...0.4%, β-glucan - 0...1.0%, curcumin - 0...0.2%. Hydrolyzed whey concentrate [5] and sugar in amounts of 83.8...84.6 and 15%, respectively, were used as basic ingredients in the recipe of acidophilic-whey ice cream. In order to ensure the validity of the assessment, the ice cream samples were coded: control - AV, sample 1 - AN, sample 2 - AT, sample 3 - AH, sample 4 - AL.

The organoleptic evaluation according to five quality criteria was carried out in accordance with the known requirements [6] for the quality of sour-milk ice cream and was calculated using weighting coefficients that had the following values: appearance - 0.15, color - 0.15, smell - 0.2, consistency - 0.25, taste - 0.25. The authors developed a list of typical defects for each quality criterion that may occur during the production of low-fat and low-fat ice cream with oat β-glucan. Taking into account the possible defects of ice cream during the organoleptic evaluation made it

possible to introduce a correction factor into the formula. So, if a discrepancy was not detected for the quality criterion, then the coefficient was multiplied by 5. In the case of a discrepancy, the coefficient was multiplied by a lower score - from 1 to 4, on the basis that one defect leads to a reduction of 1 point for a minimum score of not less than 1 point. The results of the assessment are shown in fig. 1.

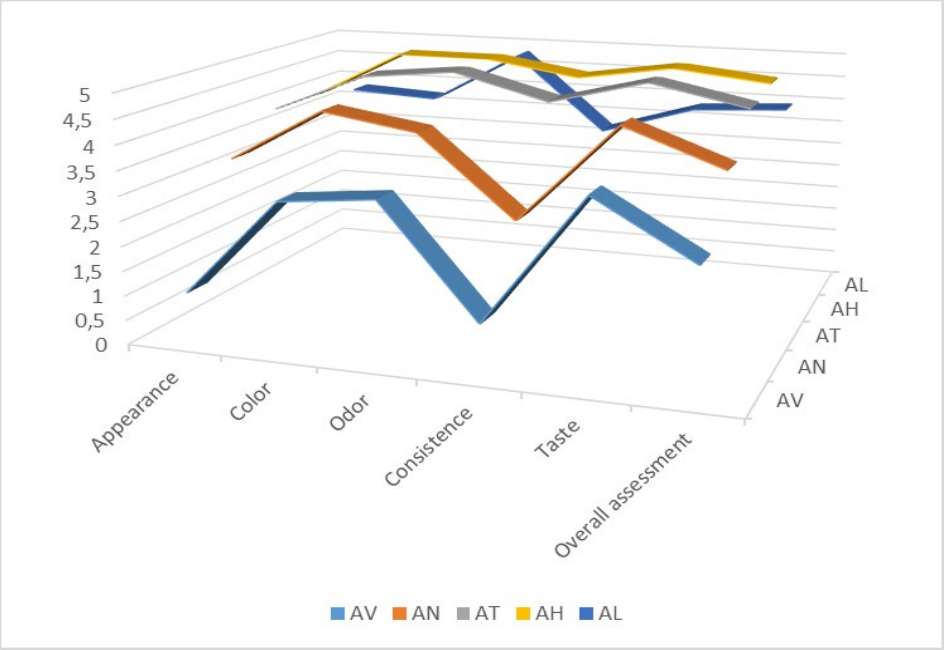

Figure 1 – Organoleptic evaluation of ice cream obtained using a modified qualimetric method

The modified qualimetric method of organoleptic evaluation of ice cream is more accurate and selective and focuses on identifying product inconsistencies, which significantly affects the results of the final evaluation. The obtained data confirm the expediency of applying oat beta-glucan at the level of 0.75 %, which correlates with the functional and technological properties of ice cream and provides the highest indicators of organoleptic perception.

Conclusions.

As a result of the research work, a 5-point scale was developed taking into account the importance factors of organoleptic parameters of acidophilic-whey ice cream with oat beta-glucan. The use of this scale allowed the gradation of the quality of the traditional type of ice cream and the new composition (for beta-glucan doses from 0.25 to 1.0 %) by determining the level of quality of ice cream for each of the organoleptic parameters. This approach provides an understanding of the advantages and disadvantages of the developed composition of ice cream and provides an opportunity to effectively compare it with traditional counterparts.

References:

1. Atallah, A. A., Morsy, O. M., Abbas, W., & Khater, E.-S. G. (2022). Microstructural, Physicochemical, Microbiological, and Organoleptic Characteristics of Sugar- and Fat-Free Ice Cream from Buffalo Milk, *Foods*, 11(3), 490. https://doi.org/10.3390/foods11030490.

2. Polishchuk, G., Kochubei-Lytvynenko, O., Osmak, T., Kuzmyk, U., Bass, O., Mykhalevych, A., Sapiga, V. (2021). Scientific explanation of composition of acidophilic-whey ice cream, enriched with protein, *Food and Environment Safety Journal*, 20(1), pp. 13-20. https://doi.org/10.4316/fens.2021.002.

3. Kuzmyk, U., Bass, O., Mykhalevych, A., Osmak, T. (2021). Investigation of the fermentation process of demineralized whey concentrates for ice cream production, *Trends in LEAN food production and packaging: Proceedings of the10th International Specialized Scientific and Practical Conference*, Kyiv : NUFT, pp. 122–123.

4. Konuklar, G., Inglett, G. E., Carriere, C. J., Felker, F. C. (2004). Use of a β-glucan hydrocolloidal suspension in the manufacture of low-fat Cheddar cheese: manufacture, composition, yield and microstructure, *International Journal of Food Science & Technology*, 39, pp. 109-119. https://doi.org/10.1046/j.0950-5423.2003.00750.x.

5. Osmak T., Mleko S., Bass O., Mykhalevych A., Kuzmyk U. (2021). Enzymatic hydrolysis of lactose in concentrates of reconstituted demineralized whey, intended for ice cream production, *Ukrainian Food Journal*, 10(2), pp. 277-288. https://doi.org/10.24263/2304-974X-2021-10-2-6.

6. Ianchyk, M., Savchuk, Yu. (2021). Technology of smoothie based on walnut nut beverage with addition of banana and cocoa powder, *SWorldJournal*, 1(07-01), pp. 93–97. https://doi.org/10.30888/2663-5712.2021-07-01-085.

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