G.A. Hakhoyan, I.H. Melkonyan, K.S. Stepanyan, A.H. Grigoryan

DEVELOPMENT OF A TECHNOLOGY FOR A NOVEL FERMENTED DAIRY PRODUCT WITH OAT FLAKES AND REDUCED LACTOSE CONTENT

UDC–637.146. 577.152.3

OPTIMIZING PARALLEL OPERATION OF AGGREGATES EQUIPPED WITH CROSSFLOW TURBINES

Garegin A.Hakhoyan
Armernian National Agrarian University
74, Teryan st. 0009, Yerevan
e-mail: gar.haxoyan@gmail.com
ORCID iD: 0009-0002-0021-8265
Republic of Armenia

Inna G.Melkonyan
Russian-Armenian University (RAU)
Hovsep Emin 123, Yerevan, 0051, RA
e-mail: innamelqonyan3004@gmail.com
ORCID iD: 0009-0003-9960-4428
Republic of Armenia

Khoren S.Stepanyan
Mkhitar Heratsi Yerevan State Medical University
Armenia, 0025, Yerevan Koryuni St., 2 Building
e-mail: xorenstepanyan163@gmail.com
ORCID iD: 0009-0003-4073-5204
Republic of Armenia

Alisa H.Grigoryan
Armernian National Agrarian University
74, Teryan st. 0009, Yerevan
e-mail: alisa.grigoryan73@gmail.com
ORCID iD: 0009-0004-9722-2757
Republic of Armenia

https://doi.org/10.56243/18294898-2025.4-57

Abstract

The aim of this study was to develop a production technology for fermented dairy products with reduced lactose content enriched with oat flakes. For this purpose, finely milled oat flakes were selected, and their optimal dosage was determined to be 3%. The optimal sugar concentration in the product was set at 5%. The sensory properties and titratable acidity of yogurt were investigated. Microbiological parameters of yogurt samples were comparatively evaluated, particularly with respect to coliforms, yeasts, and molds.

The results of the study demonstrated that the number of the above-mentioned microorganisms, as well as the sensory and chemical indicators of the experimental samples,

complied with the requirements established by CU TR 033/2013 “On Safety of Milk and Dairy Products”.

The production of this product will contribute to the diversification of fermented dairy assortments and provide consumers with a nutritious and beneficial food.

Keywords: yogurt, lactose hydrolysis, oat flakes, sensory properties, microbiological indicators.

Introduction

In recent years, the development of functional and alternative dairy products has become a major focus in food science and nutrition. Conventional dairy products are rich in essential nutrients such as proteins, calcium, and bioactive peptides. However, for individuals suffering from lactose intolerance or cow’s milk protein allergies, their consumption can lead to discomfort and dietary limitations. Therefore, an increasing number of studies have been directed toward the development of low-lactose and lactose-free products, demonstrating their growing role in modern nutrition [1, 2]. Alongside the demand for lactose-free foods, there has been increasing consumer interest in plant-based alternatives. Among various cereals, oats (Avena sativa) have received considerable attention. Researchers have shown that oats contain β-glucans, polyphenols, and proteins that not only improve the nutritional quality of the diet but also exert cholesterol-lowering and prebiotic effects [3]. Furthermore, it has been demonstrated that the incorporation of oats in fermented dairy-like products enhances satiety and supports cardiovascular health, highlighting their role as a promising functional ingredient [4].

Fermentation itself plays a critical role in improving the quality of cereal-based dairy alternatives. Several studies have reported that fermentation with lactic acid bacteria not only increases the bioavailability of nutrients but also improves texture, flavor, and product stability [6]. Moreover, it has been shown that selecting specific probiotic strains of *Lactobacillus* and *Bifidobacterium* can optimize both the sensory characteristics and the functional potential of oat-based yogurts [6].

Recent investigations have also explored the enrichment of oat-based yogurts with functional additives such as chia seeds, flaxseed, or honey. These studies have demonstrated improvements in antioxidant capacity, rheological behavior, and consumer acceptability, further emphasizing the multifunctional potential of cereal-based dairy alternatives [7].

Taken together, the current body of research highlights that the integration of oats into low-lactose or lactose-free fermented dairy products not only addresses the nutritional needs of lactose-intolerant populations but also responds to global consumer trends toward sustainable, plant-based, and health-promoting foods.

Conflict Setting

The growing prevalence of lactose intolerance and the increasing consumer demand for functional, nutritionally enhanced foods create a technological challenge in the dairy industry. Conventional fermented dairy products contain lactose and lack plant-derived bioactive

components, which limits their suitability for individuals with hypolactasia and reduces functional diversity within the product range.

Therefore, the central problem addressed in this study is the development of a technologically feasible method for producing a fermented dairy product with reduced lactose content, while simultaneously enhancing its nutritional and functional value through the incorporation of finely milled oat flakes. The challenge lies in determining the optimal parameters of enzymatic lactose hydrolysis, defining the appropriate dosage of oat flakes that ensures desirable sensory and physicochemical properties, and establishing compliance with microbiological safety standards.

Using principles of dairy technology, enzymology, and food microbiology, this work aims to formulate a scientifically grounded production scheme that ensures stable product quality, consumer acceptability, and safety, thereby expanding the assortment of functional fermented dairy products.

Materials and methods

The experiments were carried out at the Department of Processing Technologies of Animal Products, Armenian National Agrarian University. Yogurt was produced according to the traditional technology [8].

To induce milk coagulation, a direct-vat-set (DVS) lyophilized starter culture YF-L811 (Chr. Hansen, Denmark), containing *Streptococcus thermophilus* and *Lactobacillus delbrueckii subsp*. *bulgaricus*, was added [9]. For the preparation of a low-lactose fermented dairy product, raw cow's milk was used. Enzymatic hydrolysis of lactose was performed with the Ha-lactase 5200 preparation (Chr. Hansen, Denmark), produced by deep fermentation of *Kluyveromyces lactis* on a vegetable substrate [10, 11]. Ha-lactase is a neutral lactase with an optimal pH of 6.0–7.0.

The lactose content of milk was determined refractometrically using an IRF-464 refractometer, and the degree of hydrolysis was calculated [12]. The milk used for yogurt production contained 1% fat, titratable acidity of 18°T, density of 1029.2 g/dm³, and 9.4% dry matter.

Oat flakes (2–4 mm, ground) were added to the milk prior to pasteurization. Sugar and cinnamon were added to improve sensory properties [13].

Titratable acidity of milk and yogurt was measured titrimetrically according to GOST (State Standard of the Russian Federation) 3624 [14]. Milk and dairy products — Titratable acidity determination method. Interstate Council for Standardization, Metrology and Certification], dry matter content by drying (GOST 3626-73 1973). Milk and dairy products — Methods for determination of dry matter content. Interstate Council for Standardization, Metrology and Certification, fat content by the Gerber acid method (GOST 5867-90 1990). Milk and dairy products — Methods for determination of fat content by the Gerber method. Interstate Council for Standardization, Metrology and Certification, and density using a hydrometer (GOST 3625-84. 1984). Milk and dairy products — Methods for determination of density. Sensory evaluation of yogurt samples was conducted using a 5-point hedonic scale [15].

Microbiological parameters were assessed by determining coliform bacteria (GOST 9225), ISO 4832:2006. (2006). Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique. International Organization for Standardization, yeasts, and molds (GOST 10444.12), ISO 6611:2004. Milk and milk products — Enumeration of colony-forming units of yeasts and/or moulds — Colony-count technique at 25 °C. International Organization for Standardization].

To determine the optimal hydrolysis parameters, the degree of lactose hydrolysis was studied depending on enzyme concentration, hydrolysis temperature, and duration. For enzyme concentration (0.02%, 0.05%, and 0.1%) and temperature dependency, hydrolysis was conducted for 4 h at 20–50 °C. For time-dependency, milk was incubated at 38 ± 1 °C with enzyme concentrations of 0.02%, 0.05%, and 0.1%, while maintaining a constant temperature [16].

Research Results

At the initial stage of the study, the optimal parameters for lactose hydrolysis were determined. Considering that lactic acid bacteria present in fermented milk products ferment approximately 30% of lactose—equivalent to about 1.6 g per 100 g of product—it is advisable, when preparing milk mixtures intended for individuals with hypolactasia, to reduce the residual lactose content from 5.33% to 3.04–3.52%.

Based on the above, the aim was to decrease the initial lactose content in milk by 40–50% through enzymatic hydrolysis.

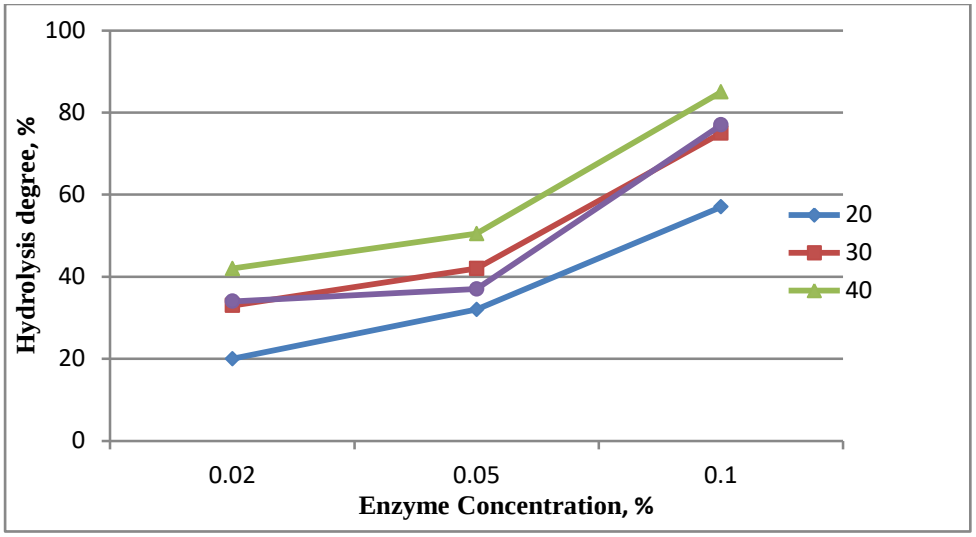

Fig. 1 Dependence of lactose hydrolysis degree on temperature and enzyme concentration

As shown in Figure 1, increasing the temperature from 20 °C to 40 °C leads to a rise in the degree of lactose hydrolysis, while a further increase up to 50 °C causes a noticeable decline. The degree of hydrolysis was 40–50% at 20 °C with 0.067–0.085% enzyme concentration; 30 °C with 0.042–0.06%; 40 °C with 0.02–0.05%; and 50 °C with 0.053–0.067%, respectively.

For the “Ha-lactase” enzyme, the optimal temperature range was determined to be 35–45 °C. Denaturation began above 50 °C, with complete inactivation observed at 72 °C.

Considering the enzyme characteristics and experimental data, the optimal hydrolysis temperature was set at 38 ± 1 °C.

According to Figure 2, with an enzyme concentration of 0.02%, the degree of lactose hydrolysis reached 40% after 3 h and did not exceed 50% even after 5 h. At 0.05% concentration, 40% hydrolysis was achieved after 1.5–2 h, and 50% after 4 h. When the enzyme concentration was increased to 0.1%, 50% of lactose was hydrolyzed within 1 h.

Thus, at 38 ± 1 °C, 40–50% hydrolysis of lactose occurred within 2–4 h at 0.02–0.05% enzyme concentration, and within 1 h at 0.1%. Since the hydrolysis degree increases with both enzyme concentration and reaction time, regulating these parameters allows achieving the desired hydrolysis level, which is essential for reducing the production cost of the final product.

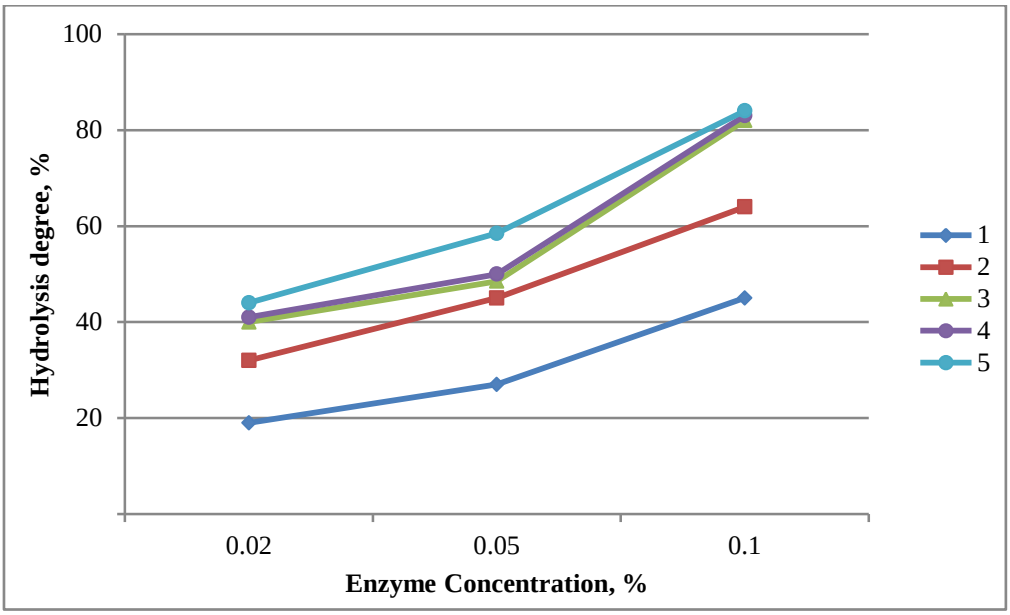

Fig. 2 Dependence of lactose hydrolysis degree on process duration and enzyme concentration

Based on the obtained data, the optimal parameters for achieving the required residual lactose concentration were defined as follows: enzyme concentration – 0.05%; process duration – 3 ± 0.1 h; temperature – 38 ± 1 °C.

The sensory and physicochemical characteristics of yogurt samples prepared with different amounts of oat flakes are presented in Figure 3.

According to Figure 3, the samples containing 2–3% oat flakes received the highest sensory scores. These yogurts had a mild lactic aroma and taste, complemented by a pleasant or moderately pronounced cereal note. The texture was homogeneous, dense or moderately thick, without syneresis, and the distribution of oat particles was uniform. The color was milky white to pale yellow, with evenly dispersed light brown inclusions.

As the amount of oat flakes increased, the flavor and aroma became more pronounced, the consistency thicker and pasty, and the color turned more yellowish. With lower amounts of

oat flakes, the consistency was comparatively less dense. The addition of oats improved yogurt consistency and prevented whey separation during storage.

The choice of stabilizers for fermented milk products is closely related to the rheological and sensory characteristics of texture. However, the effect of stabilizers on the biological value of the product is rarely assessed.

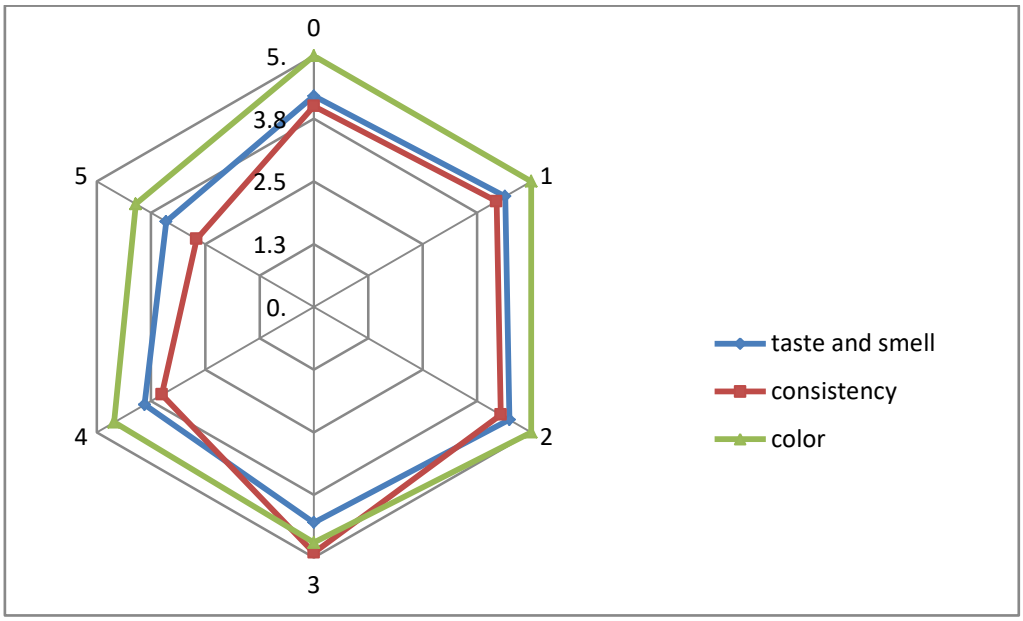

Fig. 3 Sensory and physicochemical evaluation of yogurt samples with different oat flake contents

According to previous studies, stabilizers with optimal functional properties may reduce the biological value of yogurt by up to 12%. In contrast, the addition of oat flakes not only improves texture stability but also enhances the biological value of the product, serving as a natural source of bioactive compounds such as dietary fibers, microelements, and vitamins.

The titratable acidity of all yogurt variants remained within acceptable limits, ranging from 76 °T to 88 °T.

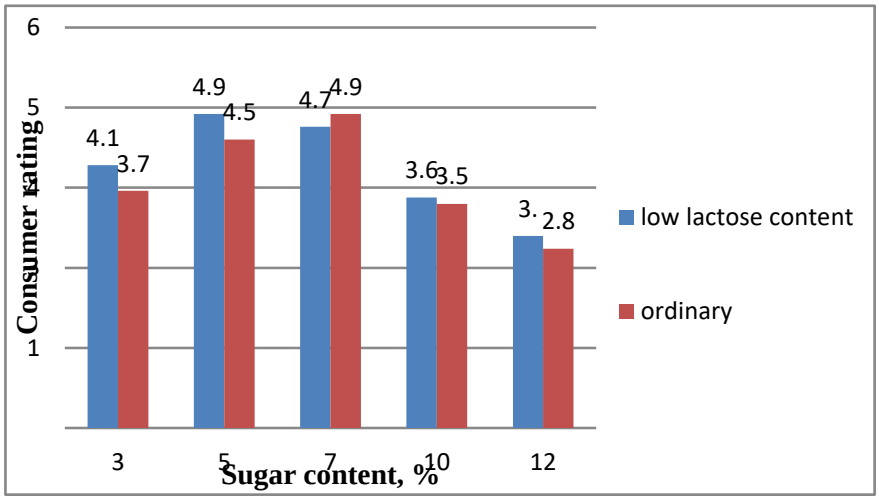

Fig. 4 Consumer evaluation of fermented milk products with different sugar contents

Lactase hydrolyzes lactose into glucose and galactose, thereby making the yogurt suitable for individuals with lactose intolerance. Moreover, the hydrolysis of lactose increases the product's sweetness due to the formation of glucose and galactose. Thus, with the addition of 5% sucrose, the yogurt acquired a pleasant sweet taste, while higher concentrations resulted in an excessively sweet flavor.

An essential indicator of food safety is the absence of pathogenic microflora. Therefore, determining the composition and quantity of microorganisms in the final product is a critical preventive measure.

The microbial parameters of yogurt—including E. coli, yeasts, molds, *Staphylococcus aureus*, *Salmonella* spp., and lactic acid bacteria—must comply with the requirements of the Eurasian Technical Regulation "On Safety of Milk and Dairy Products" (TR CU 033/2013). The viable count of lactic acid bacteria should not be less than 1×10^7 CFU/g during the storage period (TR CU 033/2013).

The results of the microbiological analysis are presented in tab.1.

Table 1

Microbiological indicators of yogurt

Product	Microbiological indicator	Permissible level	Exsperimental result
Fermented milk product (Shelf life > 72 h)	Lactic acid bacteria, min.	1×10^7	1×10^7
	Coliforms (per 0,01 g/cm^3)	Not allowed	Not detected
	Yeasts (CFU/cm^3, max.)	50	-
	Molds (CFU/cm^3, max.)	50	-

The obtained results (Table 1) show that the microbial content of the experimental samples fully complies with the safety standards established by TR CU 033/2013 "On Safety of Milk and Dairy Products".

Conclusion

A technology for producing low-lactose fermented milk with added oat flakes was developed. The optimal parameters for lactose hydrolysis using the "Ha-lactase 5200" enzyme preparation were established: temperature – 38 ± 1 °C; duration – 3 ± 0.5 h; enzyme concentration – 0.05 ± 0.01%.

Oat flakes were selected as the cereal additive, with an optimal addition level of 3%. Due to partial lactose conversion during hydrolysis, the optimal sucrose content in the formulation was

determined to be 5%. To enhance the flavor and aroma of the product, 0.01% cinnamon was added.

Microbiological analysis (for molds, yeasts, coliforms, and lactic acid bacteria) confirmed that the product meets the safety requirements of TR CU 033/2013.

Fermented milk products are known for their dietary, therapeutic, and preventive properties. The inclusion of oat flakes improves the consistency and increases the biological value of yogurt owing to their natural content of biologically active compounds (dietary fibers, trace elements, vitamins, etc.), without posing any health risks. The production of such combined functional products expands the range of fermented dairy products and contributes to providing consumers with nutritionally beneficial foods.

Acknowlegment: We gratefully acknowledge the financial support provided by the Committee of Higher Education and Science of the Republic of Armenia under the auspices of scientific topics with cod 25EDP-2I006 and "Araratyan katnamterk" LLC.

References

1. Li, A., Chen, Y., & Sun, T. Advances in low-lactose/lactose-free dairy products and their production. Foods, 12(13), 2553, 2023. https://doi.org/10.3390/foods12132553
2. Sharp, E., D'Cunha, N. M., Naumovski, N., & Blades, M. Effects of lactose-free and low-lactose dairy on symptoms of gastrointestinal health: A systematic review. International Dairy Journal, 114, 104936, 2021. https://doi.org/10.1016/j.idairyj.2020.104936
3. Raikos, V., Ni, H., & Hayes, H. Physicochemical properties, texture, and probiotic survivability of oat-based yogurt using aquafaba as a gelling agent. Food Science & Nutrition, 8(12), 6426–6432, 2020. https://doi.org/10.1002/fsn3.1932
4. Lim, E. S., Choi, J. Y., Kim, Y. S., & Shin, D. H. Preparation and functional properties of probiotic and oat-based synbiotic yogurt. Applied Biological Chemistry, 61, 151–160, 2018. https://doi.org/10.1007/s13765-017-0333-5
5. Ziarno, M., Cielecka, M., & Derewiaka, D. Microbiological and physicochemical properties of fermented oat drinks produced with selected lactic acid bacteria. International Journal of Food Properties, 27(2), 215–229, 2024. https://doi.org/10.1080/10942912.2023.2294704
6. Petrevska, S., Angelovska, B., & Dimitrovski, D. Functional oat-based yogurts enriched with chia seeds and honey: Physicochemical, sensory, and antioxidant properties. Sustainability, 16(20), 8944, 2024. https://doi.org/10.3390/su16208944
7. Wang, X., Zhao, J., & Zhang, H. Advances in yogurt development—Microbiological safety, quality, functionality, sensory evaluation, and consumer acceptance. Journal of Dairy Science, 108(3), 1234–1245, 2025. https://doi.org/10.3168/jds.2024-01195
8. Tverdokhleb, G. V., Leonova, N. B., & Tarasov, S. V. Technology of Fermented Dairy Products. Moscow: DeLi Print, 2006.

9. Chr. Hansen. YF-L811 Yogurt culture. Retrieved January 10, 2021, from https://www.chr-hansen.com
10. Otieno, D. O. Applications of β-galactosidase in food processing: A review. Biotechnology Advances, 28(6), 920–925, 2010. https://doi.org/10.1016/j.biotechadv.2010.08.006
11. Chr. Hansen. Ha-Lactase 5200 – Enzyme for lactose hydrolysis. Retrieved January 10, 2021, from https://www.chr-hansen.com
12. International Dairy Federation (IDF). International Dairy Federation Standards: Analytical Methods for Milk and Dairy Products. Brussels: IDF, 2010.
13. Savaiano, D. A. Lactose digestion from yogurt: Mechanism and relevance. The American Journal of Clinical Nutrition, 112 (Suppl 2), 515S–520S, 2020. https://doi.org/10.1093/ajcn/nqaa064
14. ISO 4832:2006. Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique. International Organization for Standardization, Geneva, 2006.
15. Meilgaard, M., Civille, G. V., & Carr, B. T. Sensory Evaluation Techniques (5th ed.). CRC Press, 2015.
16. Otieno, D. O. Applications of β-galactosidase in food processing: A review. Biotechnology Advances, 28(6), 920–925, 2010. https://doi.org/10.1016/j.biotechadv.2010.08.006

References

1. Li, A., Chen, Y., & Sun, T. Advances in low-lactose/lactose-free dairy products and their production. Foods, 12(13), 2553, 2023. https://doi.org/10.3390/foods12132553
2. Sharp, E., D'Cunha, N. M., Naumovski, N., & Blades, M. Effects of lactose-free and low-lactose dairy on symptoms of gastrointestinal health: A systematic review. International Dairy Journal, 114, 104936, 2021. https://doi.org/10.1016/j.idairyj.2020.104936
3. Raikos, V., Ni, H., & Hayes, H. Physicochemical properties, texture, and probiotic survivability of oat-based yogurt using aquafaba as a gelling agent. Food Science & Nutrition, 8(12), 6426–6432, 2020. https://doi.org/10.1002/fsn3.1932
4. Lim, E. S., Choi, J. Y., Kim, Y. S., & Shin, D. H. Preparation and functional properties of probiotic and oat-based synbiotic yogurt. Applied Biological Chemistry, 61, 151–160, 2018. https://doi.org/10.1007/s13765-017-0333-5
5. Ziarno, M., Cielecka, M., & Derewiaka, D. Microbiological and physicochemical properties of fermented oat drinks produced with selected lactic acid bacteria. International Journal of Food Properties, 27(2), 215–229, 2024. https://doi.org/10.1080/10942912.2023.2294704
6. Petrevska, S., Angelovska, B., & Dimitrovski, D. Functional oat-based yogurts enriched with chia seeds and honey: Physicochemical, sensory, and antioxidant

properties. Sustainability, 16(20), 8944, 2024. https://doi.org/10.3390/su16208944

7. Wang, X., Zhao, J., & Zhang, H. Advances in yogurt development—Microbiological safety, quality, functionality, sensory evaluation, and consumer acceptance. Journal of Dairy Science, 108(3), 1234–1245, 2025. https://doi.org/10.3168/jds.2024-01195
8. Tverdokhleb, G. V., Leonova, N. B., & Tarasov, S. V. Technology of Fermented Dairy Products. Moscow: DeLi Print, 2006.
9. Chr. Hansen. YF-L811 Yogurt culture. Retrieved January 10, 2021, from https://www.chr-hansen.com
10. Otieno, D. O. Applications of β-galactosidase in food processing: A review. Biotechnology Advances, 28(6), 920–925, 2010. https://doi.org/10.1016/j.biotechadv.2010.08.006
11. Chr. Hansen. Ha-Lactase 5200 – Enzyme for lactose hydrolysis. Retrieved January 10, 2021, from https://www.chr-hansen.com
12. International Dairy Federation (IDF). International Dairy Federation Standards: Analytical Methods for Milk and Dairy Products. Brussels: IDF, 2010.
13. Savaiano, D. A. Lactose digestion from yogurt: Mechanism and relevance. The American Journal of Clinical Nutrition, 112 (Suppl 2), 515S–520S, 2020. https://doi.org/10.1093/ajcn/nqaa064
14. ISO 4832:2006. Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique. International Organization for Standardization, Geneva, 2006.
15. Meilgaard, M., Civille, G. V., & Carr, B. T. Sensory Evaluation Techniques (5th ed.). CRC Press, 2015.
16. Otieno, D. O. Applications of β-galactosidase in food processing: A review. Biotechnology Advances, 28(6), 920–925, 2010. https://doi.org/10.1016/j.biotechadv.2010.08.006

G.A. Hakhoyan, I.H. Melkonyan, K.S. Stepanyan, A.H. Grigoryan

DEVELOPMENT OF A TECHNOLOGY FOR A NOVEL FERMENTED DAIRY PRODUCT WITH OAT FLAKES AND REDUCED LACTOSE CONTENT

ՎԱՐՍԱԿԻ ՓԱԹԻԼՆԵՐՈՎ ԵՎ ԼԱԿՏՈԶԻ ՑԱԾՐ ՊԱՐՈՒՆԱԿՈՒԹՅԱՄԲ ՄԱԿԱՐԴՎԱԾ ԿԱԹՆԱՄԹԵՐՔԻ ՆՈՐ ՏԵԽՆՈԼՈԳԻԱՅԻ ՄՇԱԿՈՒՄ

Գ.Ա. Հախոյան[1], Ի.Գ. Մելքոնյան[2], Խ.Ս. Ստեփանյան[3], Ա.Հ. Գրիգորյան[1]

[1]Հայաստանի Ազգային Ագրարային Համալսարան (ՀԱԱՀ)

[2]Ռուս-հայկական սլավոնական համալսարան

[3]Երևանի Մխիթար Հերացու անվան պետական բժշկական համալսարան (ԵՊԲՀ)

Այս ուսումնասիրության նպատակն էր մշակել ֆերմենտացված կաթնամթերքի արտադրության տեխնոլոգիա՝ լակտոզի նվազեցված պարունակությամբ, հարստացված վարսակի փաթիլներով: Ընտրվել են մանրացված վարսակի փաթիլներ և որոշվել է դրանց օպտիմալ չափաքանակը՝ 3%: Արտադրանքում շաքարի օպտիմալ կոնցենտրացիան կազմել է 5%: Ուսումնասիրվել են յոգուրտի օրգանոլեպտիկ հատկությունները և տիտրվող թթվայնությունը: Կատարվել է յոգուրտի նմուշների մանրէաբանական պարամետրերի համեմատական գնահատում, մասնավորապես՝ կոլիֆորմների, խմորիչների և բորբոսների պարունակության համար:

Ուսումնասիրության արդյունքները ցույց են տվել, որ այս միկրոօրգանիզմների քանակը, ինչպես նաև փորձարկվող նմուշների օրգանոլեպտիկ և քիմիական պարամետրերը համապատասխանում են «Կաթի և կաթնամթերքի անվտանգության մասին» ՄՄՏԿ 033/2013 պահանջներին:

Այս արտադրանքի արտադրությունը կնպաստի ընդլայնել ֆերմենտացված կաթնամթերքի տեսականին և սպառողներին կապահովի սննդարար և առողջարար սննդամթերքով:

Բանալի բառեր. յոգուրտ, լակտոզի հիդրոլիզ, վարսակի փաթիլներ, օրգանոլեպտիկ հատկություններ, մանրէաբանական ցուցանիշներ:

Разработка технологии нового ферментированного молочного продукта с овсяными хлопьями и пониженным содержанием лактозы

Г.А. Ахоян[1], И. Г. Мелконян[2], Х. С. Степанян[3], А.Х. Григорян[1]

[1]Национальный аграрный университет Армении (НАУА)

[2]Российско-армянский (Славянский) университет

[3]Ереванский Государственный Медицинский Университет имени Мхитара Гераци

Целью данного исследования было разработать технологию производства ферментированных молочных продуктов с пониженным содержанием лактозы, обогащённых овсяными хлопьями. Для этого были выбраны тонко измельчённые овсяные хлопья, оптимальная дозировка которых составила 3%. Оптимальная концентрация сахара в продукте была установлена на уровне 5%. Были исследованы органолептические свойства и титруемая кислотность йогурта. Проведена сравнительная оценка микробиологических показателей образцов йогурта, в частности содержания колиформных бактерий, дрожжей и плесневых грибов.

G.A. Hakhoyan, I.H. Melkonyan, K.S. Stepanyan, A.H. Grigoryan

DEVELOPMENT OF A TECHNOLOGY FOR A NOVEL FERMENTED DAIRY PRODUCT WITH OAT FLAKES AND REDUCED LACTOSE CONTENT

Результаты исследования показали, что количество указанных микроорганизмов, а также органолептические и химические показатели опытных образцов соответствуют требованиям ТР ТС 033/2013 "О безопасности молока и молочной продукции".

Производство данного продукта способствует расширению ассортимента ферментированных молочных изделий и обеспечивает потребителей питательным и полезным продуктом питания.

***Ключевые слова*:** йогурт, гидролиз лактозы, овсяные хлопья, органолептические свойства, микробиологические показатели.

Submitted on 14.08.2025
Sent for review on 20.08.2025
Guaranteed for printing on 29.12.2025