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SUBSTANTIATION OF THE OPTIMALITY OF THE SET MODES FOR DOUBLE-SIDEDPRESSING OF CHEESE “LORI”

Abstract. The article examines the effect proposed for the first time by new methods: a two-sided non-napkin without repressing, a two-sided step non-napkin without repressing with a smaller number of pneumatic cylinders.

To establish the optimal mode of double-sided pressing for “Lori” cheese, the screw press was reconstructed into a pneumatic one, providing a more accurate perpendicularity of the rod in relation to the surface layer of the cheese mass.

A technological regime has been determined. In order to substantiate the optimality of the established regime of double-sided pressing, microbiological, rheological and biochemical studies were carried out.

According to the distribution of moisture in fresh cheese, samples taken in 3 places in height showed that from the edge to the central part it increases depending on the height: the higher the height, the more moisture in the central part at points (a, b, c), and the fluctuation in the control cheeses is 1.7%, and in the experimental ones - 1.2%, i.e. 0.5% higher.

The content of nitrogenous substances in cheese “Lori” is soluble forms in fresh experimental cheeses with double-sided pressing by an average of 0,716%, and non-protein nitrogenous substances by 0,019% more than the content in control cheeses with repressing.

Key words: anisotropy, soluble and non-protein nitrogen, valve, ruler, cog, ferrule, telescopic, perforated, goffered, clamps.

Introduction. In cheese making, from technological processes, the moulding and cheese pressing play an important role. The grains in the finished cheese mass are usually of different sizes, and they need to be combined into large monolithic pieces. Monoliths are given various shapes: spherical, cylindrical, rectangular, square, etc. Cheeses are also moulded to separate the whey remaining between the grains. Besides, the shape of the cheese in some way affects the process of ripening and drying during storage. So, ripening of soft cheeses goes from the surface to the inside, so they are mainly produced in small sizes (2-3 kg), but with a large specific surface. Hard cheeses ripen from the centre to the periphery, their size is larger, and the specific surface in relation to the cheese mass is smaller. With a change in shape, the surface area also changes. With the same mass, the smallest surface will have a round cheese, then cylindrical, square and rectangular [1, 2, 3].

With a change in the shape and surface area, the moisture distribution of the cheese mass (anisotropy), the development and distribution of microorganisms that occur during ripening also change, which ultimately affects the quality of the product.

Sources of flavouring and aromatic substances of cheese are all macronutrients: fats, proteins, carbohydrates. The hydrolysis of these macronutrients is carried out by microorganisms, i.e., it is impossible to develop cheese without microorganisms [1, 2, 3].

Thus, it is essential to create conditions (moisture, temperature and pH) to produce cheeses of the required quality. It is more important to distribute moisture in the cheese mass, which depends on the napkin wrapping, repressing, non-napkin and without repressing, the optimal modes (pressure and duration) and pressing method, as well as the incompatibility of technological processes (assembly and disassembly of moulds, filling of cheese grains, moulding, pressing and notching cheese from the mould) that lead to an increase of anisotropy ofthe cheese mass. In this sphere, a technological analysis of the review literature was carried out to determine the influence of each of these technological processes, anisotropy change (uneven distribution of moisture) in the cheese mass. Technological analysis has shown how three methods- using a napkin with repressing, one-sided pressing using a napkin with repressing and one-sided pressing without napkins, without repressing the cheese mass are still used in cheese making abroad and in the CIS.When self-pressing, there is pressure from the upper layers of the cheese mass on the lower ones.In the method of the second and third one-sided pressing in the direction of the side to be pressed from top to bottom, the pressure, of course, drops. What happens in the third method? In the method, the following occurs: the initial acting pressure force of 0.1 kg /cm^2 is very weak and does not reach the lower layers of the cheese mass. In this case, the upper layers are compacted. At the same time, the lower layers of the cheese mass are compacted due to the pressure of the upper layers on the lower ones (self-pressing).A gradual increase in pressure up to 0.5 kg / cm^2 reaches the lower layers, but not completely, and it is greater than the effective pressure of the upper layers on the lower ones (self-pressing). As a result, the upper layers are compacted more than the lower ones. This method is effective for low-height cheeses. In both methods, repressing of the cheese mass is required for the equation of moisture distribution and density of the upper and lower layers of the cheese mass. If the pressure in the technological mode is higher than the norm over the cheese mass, then the drainage of the napkin is more pressed out that leads to rapid drying and closure due to the capillary openings and, ultimately, to settling of the whey in the capillaries. Besides, large pressings can be cut off when notching pressed cheese from the mold. Unwanted microorganisms can enter these places, which further deteriorate the quality of the cheese. If the pressure is less, then the cheese is not fully pressed, i.e. again leads to the settling of whey in the capillaries. These operations increase the cost price of cheese, reduce the labor productivity, hinder the implementation of production flow, hamper the complex mechanization and automation of cheese production [4].

Theory of anisotropy formation. When cheese grains are displaced under the pressure of the pressing force, capillaries are formed in the inter-granular space, through which a leakage of the whey occurs in different directions to the surface of the cheese mass.

Thus, the repressing and the napkin lead to the coincidence of the holes of mesh tape with the pressing, as a result of which the size of the pressing increases and the holesget quickly dried and closed, leading to the settling of whey in the capillaries. The whey can exit through other capillaries if the pressure is higher than in adjacent capillaries, but this extends the duration of pressing. And if the whey remains in the capillaries, then the moisture will be higher than in those capillaries, the holes of which did not close. As a result of this, the anisotropy increases, which is so unwanted in anisotropy. Besides, during one-sided pressing, the pressure from the pressing side towards the lower layers decreases, as a result of which, the density in the upper and lower clothes is different, for which they resort to repressing [4].

The above mentioned factors adversely affect the intensity of flow of the biochemical and microbiological processes. In this regard, the most important issue of cheese making is the development and widespread industrial introduction of new advanced technologies and technical means, such as the non-napkin pressing of cheeses.

Thus, the above mentioned technological processes increase the anisotropy of the cheese mass, reducing the quality of the cheese.

Technical analysis. In the last decade, many natural cheese production processes have been mechanized and automated. A few semi-industrial and industrial methods for the continuous production of cheese mass, its molding and pressing, various designs of apparatus of periodic and continuous actions are used. To obtain high-quality cheese mass, molding and dosing devices, presses (lever, screw and pneumatic, horizontal, tunnel) were used. Until now, methods, designs of forms and devices have been used in cheese making mainly for the implementation of one-sided pressing of cheeses. Among them, a special place is occupied by tunnel presses, in which two types of devices are used as power elements developing the pressing force: [5, 6]

1. Pneumatic cylinders: a separate pneumatic cylinder presses on each cheese bar. Thus, the difference in height of each of the cheese bars does not matter much, the presses with pneumatic cylinders have a large working space height, which facilitates the loading. Moreover, their design provides parallelism of the upper and lower planes at any load and any molding method. This positive feature makes such presses attractive to many cheese producers. Such a pressing design is quite high-priced and material-intensive, but it is considered the best and is used in cheese production with a large mass.

2. Flexible inflatable power elements: the disadvantage of such elements lies in the small size of the working stroke (with large differences in the height of the cheese heads, the quality of the pressing may deteriorate), the advantage is in high specific press ureprovided by the specificity of press designs with the use of flexible power elements. Thus, the main way to create the pressing pressure is to use the energy of

compressed air and most often a separate pneumatic cylinder presses on each cheese bar in them. At the same time, the compaction of the cheese mass in the direction from the pressed side downwards falls anyway, and to obtain the same density of the upper and lower sides, the cheeses are repressed. This is a very time-consuming process, leading to an uneven distribution of moisture and hardness in the cheese mass, therefore, to an uneven distribution and development of microflora and to non-intensive flow of biochemical processes in the cheese mass, in the result of which the quality of cheese decreases.

Therefore, the current method of one-sided pressing of cheeses with repressing, without repressing and using napkins leads to cheese anisotropy [5, 6].

Of the existing tunnel presses, presses of high automation manufactured by “Press Pallet” company are distinguished. Press pallets are combined into blocks that have a common compressed air supply system, as well as a system of lifting and transporting devices for loading and unloading the presses (press- room equipped with Chalon Megard press pallets) [7].

Analysis of the existing pressing systems allows to conclude that they are constantly being improved, but the main way to create pressing pressure is to use the energy of compressed air.

Improvements concern the automation of loading and unloading systems, and not the design of forms, molds and installations [5], [6].

Thus, to produce high-quality cheese, it is necessary to obtain a cheese mass with a more even distribution of moisture and hardness during pressing.

Consequently, the improvement and development of high-efficiency continuously operating hardware, techniques and technology for the production of natural cheeses, particularly the processes of producing the cheese mass, its molding and pressing, has been and remains an urgent task of science and practice.

We offer the first 3 methods of double-sided pressing: double-sided non-napkin, double-sided stepnon-napkin (with fewer pneumatic cylinders) and double-sided non-napkin pressing using electromagnetic forces (without pneumatic cylinders).

Since the cheese mold partially influences the ripening process of cheeses, after studying the influence of the first method on round shape (Dutch) and Swiss (cylindrical) cheeses and obtaining positive results, we decided to study its effect on rectangular cheeses (“Lori”).

Cheese “Lori” is produced from pasteurized milk, with a 50% fat content, no more than 44% moisture and 3.5-4.5% salt. The shape of the cheese is a rectangular bar with length 28-30 cm, width 14-15 cm, high 10-12 cm and weighing 4.5-5 kg. It is molded from a layer, the cut pieces are placed in a mold with a napkin and self-pressed for 5-6 hours with repeated (4-5 times) turning. The cheese ripens in pellicle for 45 days. The mature product does not have a crust.

Organoleptic characteristics of cheese “Lori”: has a spicy and salty taste, the consistency is dense, slightly brittle when bent, dough color from white to yellow, the image consists of eyes of various shapes and sizes.

To resolve the set goal, we formulated the following tasks:

1. To develop and manufacture prototypes of screw and pneumatic molds for double-sided pressing of rectangular cheese “Lori”, and a dynamometer for measuring the pressing force over the cheese mass. For developing and manufacturing a device for determining the hardness of cheeses.
2. To set the optimal mode (pressure and duration) of two-sided pressing for cheese “Lori”, depending on the height and weight [8].
3. To combine technological processes (assembly and disassembly of moulds, filling of cheese grains, moulding, pressing and notching cheese from the mould).
4. To study the influence of double-sided pressing (the first method) on the quality of cheese “Lori”.

Materials and methods. Based on the foregoing, we propose 3methods of double-sided pressing without re-pressing: double-sided non-napkin and double-sided stepnon-napkin (with fewer pneumatic cylinders).

Research methodology of the first method. Experimental research was carried out by standard and generally accepted methods according to GOST. Determination of the content of nitrogenous substances in cheese “Lori” by the Kjeldahl method GOST 23327 in 1978 at Ashotsk cheese factory of Ghukasyan region of the Republic of Armenia.We determined the moisture content in the cheese by express method (GOST 3625-75g.). Experimental cheeses “Lori” were subjected to double-sided pressing of a designed and manufactured screw and pneumatic moulds [9, 10, 11].

The aim of the work was to study a new method of double-sided non-napkin pressing on cheeses “Lori”, since the cheese shape partially affects the ripening process of the cheese to reduce the anisotropy of the cheese, with the exception of the napkin and its repressing and reducing the pressing duration, as well as the compatibility of technological processes (assembly and disassembly of moulds, filling of cheese grains, moulding, pressing and notching cheese from the mould) which should lead to an increase in the quality of the cheese, as well as the development of moulds for its implementation. The study of the influence of double-sided pressing on the quality of cheese “Lori” is determined by setting for the first time the technological mode (pressure duration).To substantiate the optimality of the set mode, rheological, microbiological(in Annotation) and biochemical studies were carried out.

Results. The rheological study showed that the sidewall edges N3 (point a) in the experimental cheeses the moisture contains: upper 46,6%, middle 47,3%, lower 46,8%, (point b)respectively 45,7%, 47,5%, and 46,3%.From here it can be seen that in all points a, b, c, the moisture is less in the edges than in the middle part, depending on the height of the cheese. The more the height, the more the moisture in the central part is.

And according to the average data at points a, b, c, the fluctuation content of the moisture (45,6-47,3) of the control cheeses is 1,7%, which is 0,5% higher, on the experimental cheeses 1,2%, and the moisture fluctuation is (45,7-46,9).

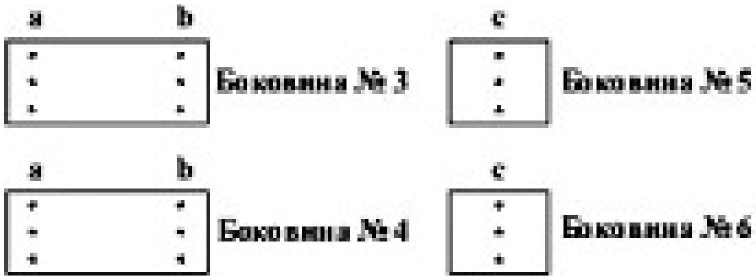
This means that in the experimental cheeses the distribution of moisture in the cheese mass along the height is more constant than in the control cheeses, and in the sidewalls No. 5, No. 6, according to average data, in the experimental cheeses is the same (45,8), and in the control cheeses (45,6-46,06) differ little from each other.

The results of the study are shown in Table 2, from the data of which it can be seen that the soluble forms of nitrogenous substances in fresh experimental cheeses with double-sided pressing is by an average of 0,716% (20,895-20,179%), and non-protein nitrogenous substances - by 0,019% (10,792-10,773%) more than their content in control cheeses with repressing.

Influence of double-sided pressing on the moisture distribution in the cheese mass of fresh cheese “Lori”. To find out what influence the double-sided pressing, carried out by the pneumatic mould we designed, has on the distribution of moisture in fresh rectangular cheese “Lori”, the moisture content on the sidewalls of the same 3 heads of experimental and control cheeses was determined, at which the distribution of hardness was determined.

On each head of experimental and control fresh cheeses of large and small sidewalls, points for taking cheese samples were marked. Samples were taken in 3 places from large sidewalls - No. 3 and No. 4 on both edges (*a* and *b*) in height, and in sidewalls No. 5 and No. 6 only from the central part (*c*) (Fig. 1).

Fig. 1 - Large sides (No. 3 and No. 4), small sidewalls (No. 5 and No. 6) of cheese “Lori”. Cheese sampling points to determine the moisture content in cheese mass.



The obtained results of the moisture content in the sidewalls No. 3, No. 4, No. 5 and No. 6 are shown in tables 1 and 2.

Table 1. Moisture content in cheese mass by height of fresh cheese “Lori”, %

Sampling place	Sidewalls					
	№3		№4		№5	№6
	a	*b*	*a*	*b*	*c*	*c*
	Experimental cheese					
upper part	46,6	45,7	45,6	46,4	45,7	45,8
middle part	47,3	47,5	45,4	46,4	46,3	46,2
lowerpart	46,8	46,3	46,3	45,3	45,4	45,4
on average	46,9	46,5	45,7	46,03	45,8	45,8
	Control cheese					
upper part	46,1	47,3	45,3	47,2	45,2	46,5
middle part	47,4	46,8	46,8	47,4	46,6	45,9
lower part	46,5	47,8	45,8	45,8	45,1	45,8
on average	46,6	47,3	45,6	46,8	45,6	46,06

From Table 1 it can be seen that in the upper and lower parts of the cheese mass of the edges of the sidewalls No. 3 and No. 4 (*a, b*) there is less moisture than in their middle part. Depending on the height of the cheese, the moisture content also changes - the more the height of the cheese, the higher the moisture content in the central part, and vice versa. On the small sidewalls No. 5 and No. 6, the moisture content both in the upper and lower parts and in the middle part is almost equalized due to the fact that the pressing force of pressure reaches the middle part of these sidewalls, as a result of which their middle part is compacted relatively more strongly.

Table 1 also shows that in the experimental and control cheeses in the upper and lower parts of all sidewalls (*a, b, c*) of the cheese, the distribution of moisture is almost the same, which indicates that with double-sided pressing, pressing conditions are provided that are similar to turning control cheeses, and according to the average data on fluctuations in points (*a, b, c*), the moisture content of control cheeses is 1,7% (45,6% -47,3%) which is 0.5% higher than that of the experimental ones- 1,2% (45,7% -46,9%).As can be seen from the table, in the experimental cheeses the distribution of moisture in the cheese mass is more uniform than in the control ones.

Thus, with double-sided pressing, the shape of the cheeses does not affect the ripening process of the cheese, but only affects the anisotropy of the cheese mass, that is, the distribution of moisture and hardness in rectangular cheeses is much more uneven than in round cheeses. This is due to the fact that in rectangular cheeses, when the cheese grains shift, sidewalls are formed under pressure, and when they are displaced towards each other, the compaction of the cheese mass increases precisely in the corners and at the edges along the width.

Our proposed new method of double-sided pressing contributes to a more uniform distribution of hardness and moisture in the cheese mass (low anisotropy) of rectangular cheeses, since the layers of the cheese mass are compacted simultaneously from both sides without repressing and napkin use.

Influence of double-sided pressing on the content of nitrogenous substances in fresh cheese “Lori”. The content of nitrogenous substances was determined in the same heads of fresh cheese “Lori”, in which the moisture content and hardness distribution were determined.

Table 2. The content of nitrogenous substances and their ratio to the total nitrogen in fresh cheese “Lori”.

Cheeses		Total nitrogen, %	Nitrogen form, %		The ratio to total nitrogen,%	
			soluble nitrogen	non-protein nitrogen	soluble nitrogen	non-protein nitrogen
Experimental	I	3,15	0,640	0,340	20,344	10,793
	II	3,16	0,669	0,341	21,170	10,791
	III	3,16	0,669	0,341	21,170	10,791
On average		3,16	0,659	0,341	20,895	10,792
Control	I	3,062	0,618	0,330	20,182	10,777
	II	3,058	0,617	0,329	20,176	10,758
	III	3,060	0,617	0,330	20,178	10,784
On average		3,06	0,617	0,330	20,179	10,773

The results of the study are shown in Table 2, from the data of which it can be seen that the soluble forms of nitrogenous substances in fresh experimental cheeses with double-sided pressing is by an average of 0,716% (20,895-20,179%), and non-protein nitrogenous substances - by 0,019% (10,792-10,773%) more than their content in control cheeses with repressing.

Discussion. For the first time, double-sided non-napkin pressing was proposed with the exception of repressings, with a decrease in the anisotropy of cheese “Lori” and a reduction in the pressing duration.

To carry out the experiment, a screw mold of cheese “Lori” and a dynamometer were designed and manufactured to measure the pressing force over the cheese mass.

The above-mentioned mold was used to determine the approximate technological mode of double-sided non-napkin pressing with the exception of repressing, reducing the pressing duration of the cheese “Lori”.

The optimality of the proposed new mode for double-sided pressing of cheese “Lori”was investigated, the screw press was reconstructed to a pneumatic one.

Rheological and biochemical studies were also carried out to substantiate the optimality of the proposed mode of double-sided pressing of cheese “Lori”.

For the implementation of double-sided presses, schemes of molds for double-sided pressing of cheese “Lori” were developed, which are fully subject to automation, combining the assembly, disassembly of molds, shaping, pressing and notch of pressed cheese.

The results of the conducted experiments and studies fully substantiate the optimality of the proposed above-mentioned mode for double-sided pressing of cheese “Lori”.

Conclusion. Based on the above-mentioned research results, it can be concluded that the proposed technological mode of double-sided pressing of cheese “Lori” is optimal.

Inference. Based on the above-mentioned research results, it can be concluded that with substantiated technological mode, further research can be continued on the effect of double-sided pressing on the quality of cheese “Lori”.

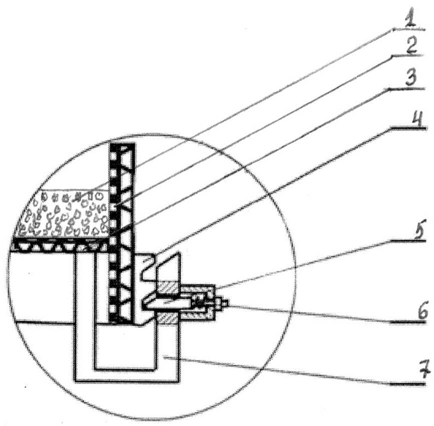
From the aforesaid research results, it became clear that this technological solution of the first method of double-sided pressing has a positive effect on the quality of cheese “Lori”. It remains to give a technical solution for the implementation of the proposed double-sided pressing.

The purpose of the technical solution is to develop a technology that combines the technological processes of cheese production (mould assembly, cheese grain filling, moulding and pressing of cheese mass, disassembly of moulds and notching the pressed cheeses from moulds), their automation with a reduction in the number of pneumatic cylinders, as well as the development of technical means for the implementation of cheese pressing without repressing and the use of napkins.

Two molds are also suggested for double-sided (step) pressing of large round and rectangular cheeses (the second method), with the possibility of full automation with a combination of mould assembly processes, filling grain in closed form, molding, pressing, mould disassembly, cheese notch.From these forms of nodes, we study the mechanism for double-sided stepped non-napkin pressing with a smaller amount of pneumatic cylinder.

From these forms of nodes, we study the mechanism for double-sided stepped non-napkin pressing with fewer pneumatic cylinder.

We present the scheme of the first node (Fig. 2):



1. Cheese 2. Perforated insert3. Lower cover 4. Serrated ruler 5. Retaining pin 6. Spring 7. Clamp.

Fig. 2 - The mechanism of stepped double-sided pressing of cheese serving to move the upper and lower covers of the mold towards each other when carrying out stepped double-sided pressing without pressing elements (pneumatic cylinders).

When assembling, the upper and lower covers are installed so that the pinshooked on the first cogof the cogruler (idle speed) located on the surface of the mold sidewalls. After the molds are assembled under the pressure of cheese grain, the automatic control valve for cheese grain filling is opened.After filling the molds, the cheese grain is pressed in a two-sided step method, i.e. the pressing force over the cheese mass is increased by changing the step of the cog ruler, according to the technological mode of the given cheese.

When introducing into production, the proposed new first method of double-sided pressing and special equipment for its implementation will contribute to improving the quality of the produced cheese “Lori”, and when introducing the second method – 23,8 million AMD ($ 47,600) from the reduction in the number of pneumatic cylinders, occupying the area for equipment and metal consumption, in comparison with the operating modern tunnel presses [12]. For example, 1 ton of Dutch cheese, 5 kg each head. Each head of cheese needs 1 pneumatic cylinder abroad in operating high-automation tunnel presses.200 pneumatic cylinders are required for 1 ton of Dutch cheese. With double-sided pressing, the number of pneumatic cylinders is doubled, i.e. 400 pieces are required for one ton. With the introduction of the second method using the mechanism of stepped double-sided pressing, the number of pneumatic cylinders is reduced to 392 pieces.

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«ЛОРИ» ІРІМШІГІН ЕКІ ЖАҚТЫ ПРЕСТЕУ ҮШІН РЕЖИМДЕРДІҢ ОҢТАЙЛЫЛЫҒЫН НЕГІЗДЕУ

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ОБОСНОВАНИЕ ОПТИМАЛЬНОСТИ УСТАНОВЛЕННЫХ РЕЖИМОВ ДЛЯ ДВУХСТОРОННЕГО ПРЕССОВАНИЯ СЫРА “ЛОРИ”

Аннотация. В статье рассматривается влияние, предложенное впервые новыми способами: двустороннее бессалфеточное без перепрессовок, двустороннее ступенчатое (шаговое) бессалфеточное без перепрессовок с меньшим количеством пневмоцилиндров.

Для установления оптимального режима двустороннего прессования для сыра “Лори” винтовой пресс был реконструирован на пневматический, по сравнению с ним обеспечивая более точную перпендикулярность штока по отношению к поверхностному слою сырной массы.

Определен технологический режим. С целью обоснования оптимальности установленного режима двустороннего прессования были проведены микробиологические, реологические и биохимические исследования.

По распределению влаги в свежем сыре пробы, взятые в 3-х местах по высоте, показали, что от края до центральной части увеличивается в зависимости от высоты: чем больше высота, тем больше влага в центральной части в точках (а, б, с), а колебание у контрольных сыров составляет 1,7%, а у опытных – 1,2%, т.е. на 0,5% выше.

Содержание азотистых веществ в сыре “Лори” – растворимые формы в свежих опытных сырах при двустороннем прессовании в среднем на 0,716 %, а небелковые азотистые вещества на 0,019% больше, чем содержание в контрольных сырах с перепрессовками.

Ключевые слова: анизотропия, растворимый и небелковый азот, клапан, линейка, зуб, обечайка, телескопический, перфорированный, гофрированный, зажимы.

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REFERENCES

[1] Dilanyan Z.Kh. The interrelationof accumulated amino acids with the type and quality of cheese. // Dairy industry.- M., 1968.- p. 31.

[2] Mordvinova V.A., Lepilkina O.V., Ostroukhova I.L., Samoilov A.V.: The features of the formation of organoleptic indicators of cheese products// Cheese making and butter making.-M., 2012, No. 2.- p. 31-33.

[3] De Vuyst A., Vervack W., Foulon M.: Detection d’amines non volatiles dans quelques fromages.// Le Lait.- 1976, 557.- p. 414-422.

[4] Onopriyko A.V., Tabachnikov V.P.: Technique and technology of non-napkin cheese pressing. Overview information, series: butter making and cheese making industry No. 3.- M.: CRIITER (ЦНИИТЭИ), Meat and dairy industry (мясо молпром), 1976.- p. 56.

[5] Mayorov A.A., Mironenko I.M.: Cheese mass pressing // Cheese-making and butter-making.- M., 2013, No. 1.- p. 26-30.

[6] Mayorov A.A., Mironenko I.M.: Cheese mass pressing // Cheese-making and butter-making.- M., 2013, No. 2.- p. 34-38.

[7] Tunnel press of "Press-Matic" type with automatic feed, Firm "Tebel", No. PD 88002.

[8] Manukyan S.S.: The optimal mode of double-sided pressing of cheese "Lori" // Cheese making and butter-making. - 2013, No. 4.- p. 16-17.

[9] State standards of the USSR. Milk, dairy products and canned milk.-M.: Publishing house of standards, 1983.- p. 424.

[10] Patratiy A.P., Aristova V.P.: Handbook for laboratory workers of enterprises of the dairy industry: M.: Food industry, 1980.- p. 240.

[11] Republican standard of the Arm SSR "Cheese "Lori", 932-85. State Planning Committee of the Armenian SSR, Yerevan, p. 8.

MEMORY OF SCIENTISTS

29.09.1932 г. - 16.09.2021 г.
Д.х.н., профессор Нигметова Роза Шукургалиевна

Нигметова Роза Шукургалиевна, которая 18 лет была заведующей лабораторией сверхчистых металлов ИОКЭ НАН РК, а затем – главным научным сотрудником этой лаборатории.

Нигметова Р.Ш. родилась 29 сентября 1932 г. В 1955 г окончила химический факультет Казахского Государственного Университета им. С.М. Кирова. В 1955-1958 г. училась в аспирантуре Института химических наук АН КазССР под руководством академика Козловского М.Т. В 1958-1961 гг. - старший лаборант лаборатории аналитической химии. 1962-1966 гг. – младший научный сотрудник лаборатории амальгамной химии Института химических наук. 1966-1969.гг. - старший научный сотрудник лаборатории сверхчистых металлов Института органического катализа и электрохимии АН КазССР. В 1980 г. Р.Ш. Нигметова возглавила эту лабораторию и посвятила ее работе и развитию всю жизнь, как крупный специалист в области физико-химии и термодинамики амальгамных систем. Р.Ш. Нигметова принимала участие в проведении внедренческих работ на свинцовом заводе им. Калинина, г. Чимкент. Диссертацию на соискание степени доктора химических наук «Термодинамические и физико-химические исследования жидких сплавов ртути с металлами II-V подгрупп периодической системы элементов» Р. Ш. Нигметова защитила в 1984 г. на ученом совете ИОКЭ, г. Алма-Ата. Р.Ш. Нигметовой впервые проведено систематическое изучение термодинамических и физико-химических свойств двойных и тройных (22 системы) амальгамных систем с использованием большого количества физико-химических методов исследования. Изучены термодинамические свойства разбавленных жидких амальгам кадмия, индия, свинца, олова, висмута, цинка при температурах 25-200^{o}С. Установлена зависимость термодинамических и физико-химических свойств жидких амальгам от положения металлов в периодической системе элементов, что позволило прогнозировать свойства еще неизученных систем. На основании полученных термодинамических данных амальгамных систем установлены критерии поведения многокомпонентных амальгам в люминесцентных лампах. В 1992 г. Р.Ш. Нигметова получила звание профессора. Р.Ш. Нигметовой опубликовано около 200 научных статей и подготовлено совместно с д.т.н. Козиным Л.Ф. 7 кандидатов химических наук. Р.Ш. Нигметова работала ученым секретарем диссертационного совета ИОКЭ. Коллеги сохранили о ней память, как о принципиальном ученом и отзывчивом человеке.

Сотрудники и коллеги.

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