

ISSN 2181-8622

Manufacturing technology problems



Scientific and Technical Journal Namangan Institute of Engineering and Technology

INDEX  COPERNICUS
I N T E R N A T I O N A L

**Volume 9
Issue 4
2024**



STUDY OF THE QUALITY OF FRUIT PASTELA PRODUCTS

TURGUNPOLATOVA SHOKHSANAM

PhD student of Namangan Institute of Engineering and Technology, Namangan, Uzbekistan

Phone.: (0894) 279-2727, E-mail.: sarvarbaratov888@gmail.com

Abstract: The scientific article substantiates the importance of enriching the pastille with useful substances for the human body and including biologically valuable substances in the recipe of this confectionery product. The technological scheme of finished product production is selected. The results of microbiological, sanitary-chemical analyzes of raw materials and finished products are presented. In order to study the microbiological indicators of fruit lozenges, samples were prepared in laboratory conditions. In order to determine the shelf life of these samples, sanitary and microbiological analysis was carried out. In order to determine the shelf life of lozenges, the dynamics of microbiological indicators were observed for 210 days, and the shelf life was set at 180 days. At the same time, the optimal conditions for its storage Pastila confectionery met the requirements of GOST 6441-2014 and the storage temperature was $(18 \pm 3)^\circ\text{C}$ and relative humidity (not more than 75%).

Keywords: microbiological indicators lozenge, assortment, enriched products, prevention, functional product, recipe.

Introduction. Confectionery products are widespread in the world, among which pastilla products occupy a special place, and it is important to develop or improve the methods of expanding the assortment of these products, that is, reducing the calories of the products, as well as increasing their energy and nutritional value [1;2; 3].

Pastila is a confectionery product made from fruit and berry puree, which contains pectin, essential micro- and microelements and other biologically active substances that improve liver, gastrointestinal tract and cardiovascular function.

Lozenges special agar-sugar-molasses syrup to strengthen the sticky, foamy and small-porous consistency of the fruit puree; gluten-free - made from fruit puree and whipped proteins.

The urgency of improving the technology of pastila preparation is determined by the fact that the studied confectionery products are in high demand among the population of our country. Also, for the purpose of prevention, it is to strengthen the human body's fight against viral and infectious diseases [4].

Today, the population's diet consists of food products with different and complex recipes. Accordingly, a new direction of the food industry is developing - designing food products. Designing food products means the production processes of complex multi-component food products that can fully satisfy consumer demand, meet the requirements and principles of standardized nutrition, and have a set of necessary nutritional properties. understood [5;6] .

Methods. Designing new food products with a complex polycomponent composition allows solving a number of problems [7]:

- provides the human body with the necessary set of physiologically useful nutrients;

- formation of this direction, taking into account the possibility of enriching the human body with compounds and various biologically active substances, micro- and macroelements of products with a physiological effect;

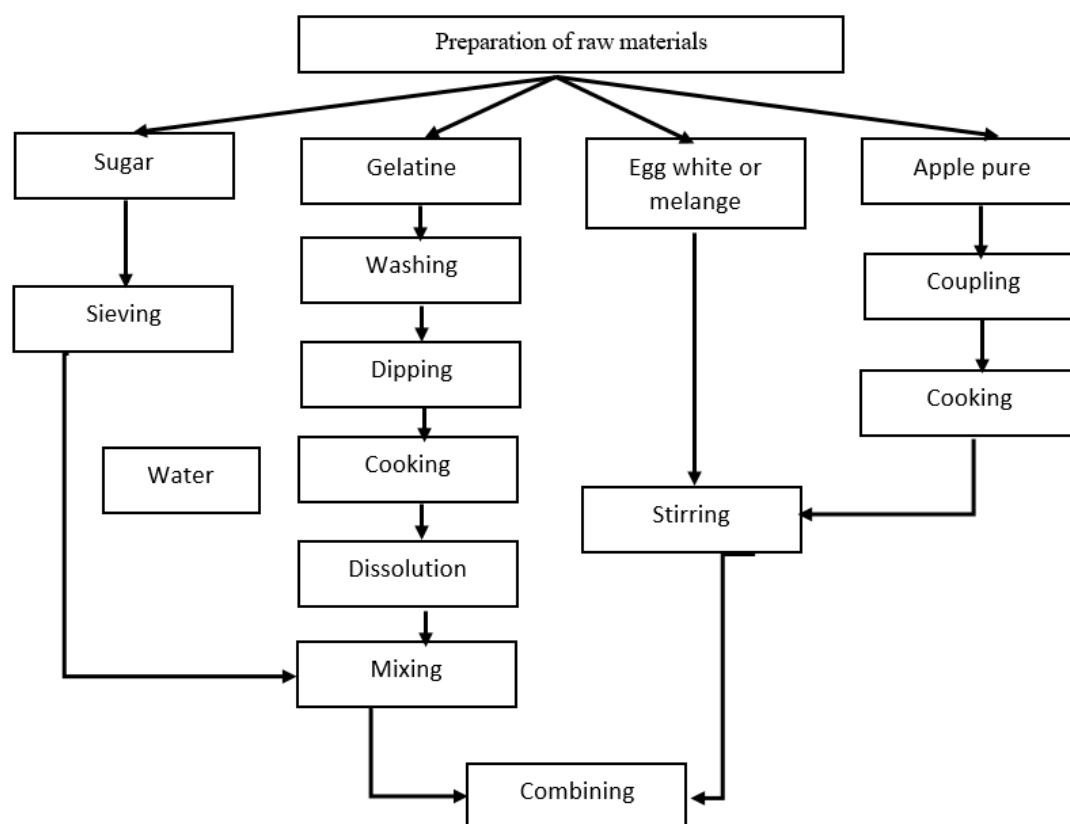
- modeling of finished product safety, quality indicators, consumer properties and predictions.

One of the main issues in designing a multi-component food system.

- in the development of new types of confectionery products with functional properties, it is considered to provide the proportions and optimal combinations of the composition of the recipe [8;9].

Taking into account the above, we offer a technological scheme for the production of fruit and vegetable pastilles with high biological value. Ready-made products are aimed at ensuring the lack of vitamins, minerals and other necessary macro- and micronutrients in the human body [10].

Scheme 1. Technological scheme of pastille preparation technology.



Samples of fresh and dried local plant raw materials: apples, plums and apricots, beets, grapes, quinces, carrots, beets, as well as medicinal plants were selected as objects of the study. In this scientific research work, we have modeled and developed recipes of new types of pastilles with specific chemical composition and functional orientation. The recipe includes freshly picked and dried fruits, as well as local medicinal plants. Such dessert products are mainly products consisting of 60 to 80% fruit mass. Low-waste innovative technologies for obtaining new types of fruit lozenges using effective technological methods that reduce the loss of biologically active substances in the finished product have been developed [11;12].

Table 1. Fruit pastille recipe

N	FRUIT PASTILLE KOMPONENTS	QUANTITY
1	PLUM PUREE OR PLUM PEEL	20
2	APPLE PUREE	60
3	PATOKA	10
4	PLANT SUPPLEMENT	4,5
5	AGAR AGAR	5,5

According to organoleptic parameters, lozenges should meet the requirements listed in Table 2 [13].

Table 2. Organoleptic parameters of fruit pastille prepared in laboratory conditions.

Name of indicators	Comment
Taste and smell	It is characteristic of the main and additional raw materials used, with a moderate level of sweetness, without extraneous flavors. The smell is characteristic of raw materials. Foreign taste and no smell is allowed
Colour	Characteristic of the color of the raw material used. Dark or light bright color is allowed
Consistency	The particles of crushed fruit and additional components are in a dense state, and easy disintegration is allowed. It is slightly soft when crushed will be
Appearance	Rectangular or round, smooth surface, uniform thickness, intact edges unbroken, retains its shape during packaging and transportation

Results. In order to study the microbiological indicators of pastilles, test samples were prepared in laboratory conditions. In order to determine the shelf life of these samples, sanitary and microbiological analysis was carried out.

Determining the shelf life of food products involves experimental testing of the process of deterioration of the food product, which ends with the determination of the time at which it reaches the end of its shelf life [14;15]. The basis of the process of justifying the shelf life of food products is to evaluate the organoleptic characteristics of the product samples during storage at the temperatures specified in the normative or technical documents, and conduct microbiological, sanitary-chemical studies. Microbiological analysis of raw materials and finished products used in the complete sanitary-epidemiological assessment of pasta was carried out for all controlled groups of microorganisms. During the storage of pastilles, microbiological studies were conducted on the following and the amount of QMAFAnM and yeast (zamburu) in the finished product was determined. In order to determine the shelf life of lozenges, the dynamics of microbiological indicators were observed for 210 days, and the shelf life was set at 180

days. At the same time, the optimal conditions for its storage Pastila confectionery met the requirements of GOST 6441-2014 and the storage temperature was $(18 \pm 3)^\circ \text{C}$ and relative humidity (not more than 75%). The obtained results are presented in Table 3.

Table 3. Microbiological indicators of the finished product.

INDICATORS	RUIT PASTILLE	Permissible limit according to SanQvaM 6441-2014, from mg/kg not much
BGKP (100 g -da)	NOT AVAILABLE	It is not allowed
Pathogens include salmonella	NOT AVAILABLE	It is not allowed
BGKP in 100 g of product (in 100 g)		
Yeasts not more than KOE/g	NOT AVAILABLE	100
Fungi more than KOE/g	NOT AVAILABLE	100

Opinions. Fruit lozenges prepared in laboratory conditions based on the technological scheme of fruit lozenge production given above were evaluated as meeting the requirements of SanQvaM. Also, the product was stored for 210 days, every 30 days samples were taken from the stored fruit lozenges and their microbiological parameters were checked, and no development of microorganisms and spoilage were observed in the product for 180 days.

Summary. Thus, the situation in the world confectionery market shows a stable trend to increase the volume of production, expand the range of products, improve the quality of raw materials, reduce their cost, and increase the consumption of confectionery products.

References:

1. Saribayeva Dilorom Akramzhanovna, Holdarova Gulsanam Akramjon Kizi. Research of the processes of obtaining functional beverages based on milk thistle extract (SILYBUM MARIANUM L.) // Universum: technical sciences. 2022. #11-4 (104). (accessed: 23.12.2022).
2. Pulatov A. S., Yakubzhanova E. E., Saribaeva D. A. The effect of heat treatment on the nutritional and biological value of mutton in the preparation of Uzbek national dishes // Modern scientific research and innovation. - 2015. – No. 7-2. - pp. 11-13.
3. . Pulatov A. S., Saribaeva D. A., Yakubzhanova E. Changes in the content of nitrogenous substances of meat during heat treatment //A young scientist. - 2016. - No. 3. –
4. Saribaeva Dilorom, Zokirova Mashkhura, Kholdarova Gulsanam Researching the technology of making beverages containing fruit juice // Universum: technical sciences. 2022. No. 1-3 (94). URL: <https://cyberleninka.ru/article/n/researching-the-technology-of-making-beverages-of-containing-fruit-juice> (Date of access: 03.11.2022).

5. Saribaeva Dilorom Akramzhanovna, Zokirova Mashkhura Sodikzhanovna Study of the elemental and amino acid composition of ginger extract // *Universum: technical sciences*. 2021. No. 11-3 (92). (Date of access: 11/03/2022).022).
6. Saribaeva Dilorom Akramzhanovna, Mallabaev Odiljon Tokhirzhanovich, Kodirov Olimjon Rakhimjon Ogli, Abdulkhaev Talib Dolimzhanovich Technology of production of candied garlic // *Universum: technical sciences*. 2020. No. 8-2 (77). (date of access: 11/03/2022).
7. Saribayeva DA, Zokirova MS, Kholdarova GA Development and analysis of medicine and natural beverages // *International Journal of Advanced Research in Management and Social Sciences*. - India, 2021. - P.31-36.
8. Khamdamov Anvar Makhmudovich, Saribaeva Dilorom Akramzhanovna Modeling the process of deodorization of fatty acids of cotton oil // *Universum: technical sciences*. 2020. No. 11-2 (80). URL: <https://cyberleninka.ru/article/n/modelirovanie-protsesa-dezodoratsii-zhirnyh-kislot-hlopkovogo-masla> (date of access: 03.11.2022).
9. Pulatov A. S., Saribaeva D. A., Yakubzhanova E. Changes in the content of nitrogenous substances of meat during heat treatment // *A young scientist*. - 2016. - No. 3. – pp. 194-196. *World of Science May, Volume-7, Issue-5*
10. Pulatov A. S., Yakubzhanova E. E., Saribaeva D. A. The effect of heat treatment on the nutritional and biological value of mutton in the preparation of Uzbek national dishes // *Modern scientific research and innovation*. - 2015. – No. 7-2. - pp. 11-13.
11. Zokirova M., Saribaeva D., Khojiev S. Research technology of production of herbal and natural preserves // *European Journal of Molecular & Clinical Medicine*. - 2020. - T. 7. – no. 2. - S. 325-333.
12. GOST 6441-2014 Izdelia confectionery pastilles. Obshchie tekhnicheskie usloviya (Pereizdanie)
13. Murodullaevich H. Q. et al. Obtaining oil from recycled materials and its use in the food industry // *European Journal of Molecular & Clinical Medicine*. - 2020. - T. 7. – No. 2. - S. 2020.
14. 13. Saribaeva D. et al. Ginger root as a source of biologically active substances // *E3S Web of Conferences*. - EDP Sciences, 2024. - T. 486. - S. 02028.
15. Akramjanovna D. S., Aripova K. O. Producing the processes of obtaining functional drinks based on medicinal plants extract // *E3S Web of Conferences*. - EDP Sciences, 2024. - T. 486. - S. 02018.
16. Yakubzhanova, Yo. (2023). Razrabotka tehnologii preparation of beverages and basic syrups with functional properties. *Gospodarka i Innowacje.*, 33, 170-177.
17. 20. Bakhridinov, N. S., Mamadaliev, Sh. M., & Yaqubzhanova, Yo. (2022). Prakticheskoe znachenie organizatsii ekologicheskogo obrazovaniyiniya v doshkolnom uchrejdenii. *Oriental renaissance: Innovative, educational, natural and social sciences*, 2(5), 443-448.

CONTENTS

PRIMARY PROCESSING OF COTTON, TEXTILE AND LIGHT INDUSTRY

Korabayev Sh.	3
From street traffic to space: innovations in autonomous vehicles	
Egamov N.	10
Investigation of vertical forced vibration in the longitudinal - vertical plane of a binder that softens the crush between cotton rows	
Khamraeva S., Kadirova D., Davlatov B.	15
Determination of alternative technological factors for the production of functional fabric with a complex structure	
Khamraeva S., Kadirova D., Daminov A.	21
Designing fabrics for a given stretchability	
Kuliyev T., Rozmetov R., Tuychiev T., Sharipov Kh.	28
The effect of the angle of heat agent supply to the drying - cleaning equipment on cotton quality and cleaning efficiency of the equipment	
Abdujabbarov M., Alieva D., Karimov R.	35
Determination of the influence of the length of the tested yarn samples on their mechanical characteristics	
Jurayeva M., Nabidjonova N.	41
Research on physical and mechanical properties of fabric selected for special clothing of preschool children	
Yangiboev R., Allakulov B., Gulmirzayeva S.	45
Studying the alternative technological factors of the loom in the production of textiles based on basalt yarn	
Ganikhanov Kh., Mavlyanov A., Abdusamatov A., Mirzaumidov A.	55
Analysis of the maintechnologicalparameters of the condenser	
Mavlyanov A., Mirzaumidov A.	60
The scientific basis of the lightened shaft	
Elmanov A., Mirzaumidov A.	69
Modeling of laser processingof thin-walled steel gears	
Nurillaeva Kh., Mirzaumidov A.	77
Cotton cleaner with multifaceted grates	
Ganikhanov Kh., Mavlyanov A., Abdusamatov A., Mirzaumidov A.	83
The equation of motion of cotton fiber in the condenser	
Khuramova Kh., Xoshimxojaev M.	89
Progressive method of cotton regeneration	

Abdulkarimova M., Lutfullaev R., Usmanova N., Mahsudov Sh.	94
Evaluation of aestheticity of women's dress models based on deep learning models	

GROWING, STORAGE, PROCESSING AND AGRICULTURAL PRODUCTS AND FOOD TECHNOLOGIES

Zufarov O., Isroilova Sh., Yulchiev A., Serkayev K.	101
Theoretical aspects of obtaining oxidation-stable vegetable oils	
Toshboyeva S., Dadamirzaev M.	110
Filling sauces for canned fish and their layer kinetics	
Atamirzaeva S., Saribaeva D., Kayumova A.	115
Prospects for the use of rose hips in food technology	
Turgunpolatova Sh.	121
Study of the quality of fruit pastela products	
Sultanov S.	126
Analysis of experiments on the process of deodorization of vegetable oil using floating nozzles	
Adashev B.	132
Physical-chemical analysis of oil taken from seeds of safflower	
Ismailov M.	137
Influence of surface layer thickness on hydraulic resistance of the device	
Khurmamatov A., Boyturayev S., Shomansurov F.	142
Detailed analysis of the physicochemical characteristics of distillate fractions	
Madaminova Z., Khamdamov A., Xudayberdiyev A.	154
Preparing peach seed for oil extraction and improving oil extraction through pressing	
Aripova K.	162
Methods of concentration of fruit juices and their analysis	
Djuraev Kh., Urinov Sh.	168
Theoretical and experimental study of the crack formation device in the shell of apricot kernels	

CHEMICAL TECHNOLOGIES

Urinboeva M., Abdikamalova A., Ergashev O., Eshmetov I., Ismadiyarov A.	175
Study of the composition and main characteristics of petroleum oils and their emulsions	
Tursunqulov J., Kutlimurotova N.	182
Application of 1-(2-hydroxy-1-naphthoazo)-2-naphthol-4-sulfo acid in amperometric determination of scandium ion	
Kucharov A.	191

Development of coal enrichment and gas extraction technology for the use of construction materials industrial enterprises	
Abdulkhaev T., Mukhammadjonov M., Mirzarakhimova F.	
Isotherm of benzene adsorption and differential heat of adsorption on AgZSM-5 zeolite	198
Vladimir L., Eshbaeva U., M.Ergashev	
Innovative environmental packaging for separating storage of two components, allowing to extend the lifetime without preservatives	204
Kodirov O., Ergashev O.	
Energetics of adsorption of water molecules to aerosol	212
Yusupov K., Erkabaev F., Ergashev D., Rakhimov U., Numonov M.	
Synthesis of melamine-formaldehyde resins modified with n-butanol	219
Ergashev O., Abdikamalova A., Bakhronov Kh., Askarova D., Xudoyberdiyev N., Mekhmonkhonov M., Xolikov K.	
Thermodynamics of Congo red dye adsorption processes on mineral and carbon adsorbents	228
Ergashev O., Maxmudov I.	
Water vapor adsorption isotherm in zeolites regenerated by microwave thermoxidation method	235
Jumaeva D., Zaripbaev K., Maxmudov F.	
The elements and oxide content of the chemical composition of the feldspar	242
MECHANICS AND ENGINEERING	
Khudoyberdiev U., Izzatillaev J.	
Analysis of research on small wind energy devices	249
Atajonova S.	
Mathematical model of system analysis of technological processes in the form of key principles for effective decision-making	258
Kuchkarbayev R.	
Mathematical modeling of heat transfer through single-layer and multi-layer cylindrical walls in buildings and structures	264
Atambaev D.	
Difference in the length of individual yarn composition of twisted mixed yarn and comparative analysis of single-thread elongation deformations	269
Abdullayev S.	
Modeling the functionalities of an automated system for managing movement in the air	276
Turakulov A.	
Describing computational domains in applications for solving three-dimensional problems of technological processes	285
Mamaxonov A.	

Mathematical model of machine aggregate of tillage equipment process	293
Khudayberdiyev A.	
Technical and economic aspects of processing pyrolysis distillate into motor fuel	304
Abdurahmonov J.	
Research results on the selection of the mesh surface of a lint-cleaning device	311
Vohidov M.	
Development of a program for determining eccentricity by analyzing the magnetic field in the air gap of an asynchronous motor	319
Utaev S., Turaev A.	
Analysis of methods and prospects for application of optical methods for control of working surfaces of cylinder liners of internal combustion engines	327
Boltabayev B.	
Determination of seed damage in the pneumatic transport system by conducting experiments	335
Azizov Sh., Usmanov O.	
Simulation of equation of motion of the new construction gin machine	339
Sharibaev N., Homidov K.	
Theoretical analysis of the coefficient of friction induced by the pressure force of a vertical rope acting from above and below	347
Aliyev B., Shamshidinov M.	
Improvement of the linter machine and development of its working scheme	356
Mukhametshina E.	
Analysis of cotton flow behavior in different pneumatic pipes	362
Yangiboev R., Allakulov B.	
Obtaining and analyzing correlational mathematical models of the sizing process	369
Mirzakarimov M.	
Efficient separation of fibers from saw teeth in the newly designed gin machine	379
Azambayev M.	
Measures to improve the quality of fluff	387
Abdullayev R.	
Scientific innovative development of cotton gining	392
Kholmiraev F.	
Air flow control factors in pneumatic transport device	397
Sharibaev N., Makhmudov A.	
Separation of cotton from airflow in pneumatic transport systems of the cotton industry	404
Sharibaev N., Mirzabaev B.	

Effect of steam temperature on yarn moisture regulation in textile industry **410**

Sultanov S., Salomova M., Mamatkulov O.

Increasing the useful surface of the mesh surface **415**

Muhammedova M.

Kinematics of the foot in a healthy person's foot and ankle injury **421**

ADVANCED PEDAGOGICAL TECHNOLOGIES IN EDUCATION

Abdullayev H.

Algorithm for creating structured diagrams of automatic control systems **429**

Kodirov D., Ikromjonova N.

On delayed technological objects and their characteristics **437**

Uzokov F.

Graphing circles, parabolas, and hyperbolas using second-order linear equations in excel **444**

ECONOMICAL SCIENCES

Zulfikarova D.

Issues of developing women's entrepreneurship **449**

Ergashev U., Djurabaev O.

Methods for assessing the effectiveness of waste recycling business activities in the environmental sector **455**
