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## GROWING, STORAGE, PROCESSING OF AGRICULTURAL PRODUCTS AND FOOD TECHNOLOGIES

# SCIENTIFIC BASIS FOR THE PRODUCTION TECHNOLOGY OF FRUIT LOZENGES (MARSHMALLOW)

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### Abstract:

**Objective.** The article is based on the importance of enriching pastille with components useful for the human body and introducing biologically valuable substances into the receptor of this confectionery product. The technological scheme for the production of finished products is selected. The results of microbiological, sanitary and chemical analyzes of raw materials and finished products are presented.

Research on the processes of preparation of confectionery products based on plant raw materials of high nutritional and biological value, expanding the range of pastila products.

**Results.** In order to study the microbiological indicators of pastilan, test-samples were prepared in laboratory conditions. Sanitary and microbiological analysis was carried out in order to determine the shelf life of these samples. To determine the shelf life of pastilles, observations of the dynamics of microbiological indicators were carried out for 210 days, and the shelf life was set at 180 days. At the same time, the optimal conditions for its storage Pastila confectionery came to the requirements of gost 6441-2014, and the storage temperature was  $(18 \pm 3)^\circ \text{C}$  and the relative humidity of the air (no more than 75%).

**Conclusion.** The situation in the world confectionery market shows a stable trend towards increasing production, expanding the range of products, improving the quality of raw materials, reducing its cost and increasing the consumption of confectionery products, which may indicate an increase in well-being and living standards of the population. At the expense of an herbal supplement with antioxidant properties, the biological value of the finished product increases, and an extension of the shelf life can be achieved. According to the results of the study, the energetic value of fruit lozenges prepared on the basis of the above recipe was calculated.

**Keywords:** prophylaxis, pastila, assortment, functional product, enriched products, prescriptions, microbiological indicators.

**Introduction.** Confectionery products are common in the world, among which pastila products occupy a special place, and it is important to expand the range of these products, that is, to develop or improve ways to reduce the calories of products, as well as increase their energy and nutritional value [1;2;3].

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

form the consistency of pastilles are divided into the following types: fruit puree is made from fruit puree and whipped proteins, special agar-sugar-patokali syrup is added to it to strengthen the consistency of whipped glue, foam and small pores.

The relevance of improving the technology of making Pastila is determined by the fact that the studied, that is, confectionery products, are in great demand among the population of our country. It is also to strengthen human organism for preventive purposes to fight viral and Infectious Diseases [4].

Currently, the population's diet consists of foods that are varied and complex in their recipe composition. Accordingly, a new direction of the food industry is developing-the design of food products. Food design refers to complex multicomponent food production processes that can fully meet consumer demand, meet regulatory nutritional requirements and principles, have a set of essential nutritional properties [5;6].

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

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

- formation of this direction, taking into account the possibility of enriching the products of physiological influence on the human body with mixtures and various biologically active substances, micro - and Macroelements in the composition of the receptor;

- safety of finished products, quality indicators, modeling and forecasting consumer properties.

One of the major issues in the design of the multicomponent nutritional system is

the provision of receptor composition ratios and optimal sets in the development of new types of confectionery product with functional properties [8;9]. Taking into account the above, we offer a technological scheme for the production of fruit and vegetable lozenges with a high biological value. Finished products are aimed at ensuring that the human body lacks the necessary macro - and micronutrients of vitamins, minerals and vitamins [10].

As objects of research, samples of fresh and dried local plant raw materials were selected: apples, haynoli (plums) and apricots, beets, grapes, beans, carrots, beets, as well as medicinal plants. In this scientific research work, we modeled and developed new types of lozenges recipes with a certain chemical composition and functional orientation.

The recipe consists of freshly picked and dried fruits, as well as maxillary medicinal plants. Such dessert products are basically a product consisting of 60 to 80% fruit mass. Low-waste innovative technologies for obtaining new types of fruit lozenges have been developed using effective technological methods that reduce the loss of biologically active substances in the finished product [11;12].

Table 1

**Fruit pastila recipe**

<b>No</b>	<b>Fruit pastila components</b>	<b>Amount</b>
1	Apple puree	60
2	Plum	20
3	Patoka	10
4	Agar	5,5
5	Herbal supplement	4,5

In terms of organoleptic indicators, pastilles must meet the requirements presented in Table 2 [13].

**Scheme 1. Technological scheme of pastille preparation technology**

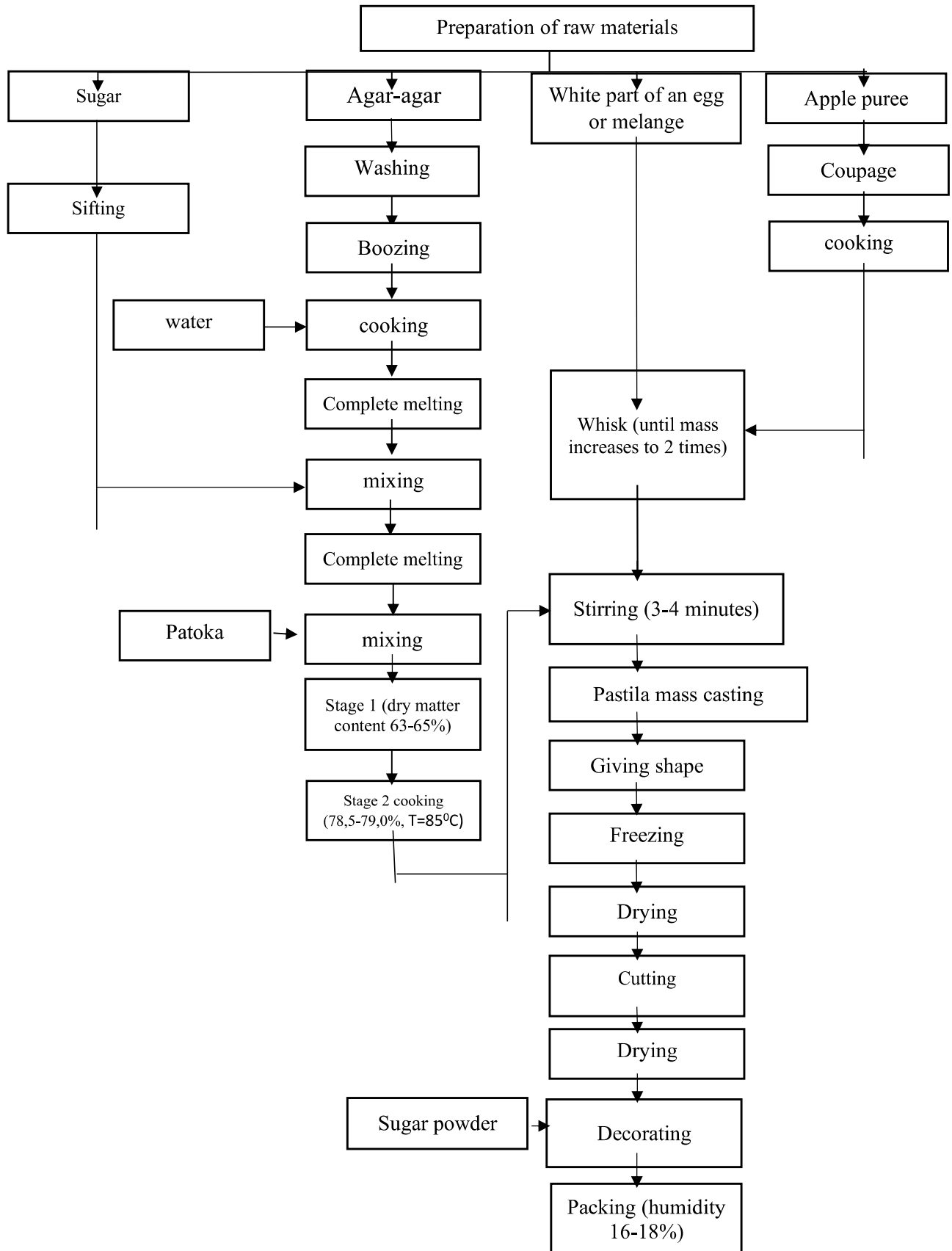


Table 2

**Organoleptic indicators of Fruit Pastille prepared in laboratory conditions**

Nomination of indicators	Description
Taste and smell	Typical of the basic and rough raw materials used, the degree of sweetness is in meiori, without extraneous flavors. KHIDI is fragrant, typical of raw materials in its composition. Foreign taste and smell are not allowed
Colour	Typical of the color of the raw materials used. It is allowed to be dark or light bright color
Consistency	Particles of crushed fruit and additional components are in a dense state, and light decomposition is allowed. It is in a slightly soft state when pressed with a crush
Appearance	Rectangular or round, with a smooth surface, the thickness is the same, intact, the edges are not broken, keep their shape during packaging and transportation

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

Determining the shelf life of a food product involves experimental testing of the food degradation process, which results in determining the time that coincides with the end of its shelf life [14;15]. The basis of the process of substantiating the shelf life of food products is to conduct microbiological, sanitary and chemical research, assessing the organoleptic properties of product

samples during storage at temperatures established in regulatory or technical documents. A microbiological analysis was carried out for all controlled groups of microorganisms of raw materials and finished products used in a complete sanitary and epidemiological assessment of the paste. In the process of preserving pastilles, microbiological studies were carried out on the following, and the amount of QMAFAnM and yeast (fungi) contained in the finished product was determined. Microbiological indicators for 210 days to determine the shelf life of pastilles dynamics.

Table 3

**Microbiological indicators of the finished product**

Indicators	Fruit pastilas	According to SanQvaM 6441-2014, the limit of access is no more than mg / kg
Pathogens including salmonella in 100 g of the product	Not available	Not allowed
BGKP (100 g -da)	Not available	Not allowed
Yeast is no more than KOE/g	Not available	100
Fungus do not exceed KOE/g	Not available	100

**Discussions.** Based on the above-mentioned technological scheme of production of fruit lozenges, fruit lozenges

prepared in laboratory conditions were assessed as meeting the requirements of Sanquam. Also, the product was stored for

210 days, samples were taken from fruit lozenges stored every 30 days and microbiologic indicators were checked, and for 180 days the product did not observe the development and bijection of microorganisms.

**Conclusion.** Thus, the situation in the world confectionery market shows a stable trend towards increasing the volume of production, expanding the range of products, improving the quality of raw materials, reducing its cost and increasing the consumption of confectionery products, which may indicate an increase in well-being and living standards of the population. At the expense of an herbal

supplement with antioxidant properties, the biological value of the finished product increases, and an extension of the shelf life can be achieved. According to the results of the study, the energetic value of fruit lozenges prepared on the basis of the above recipe was calculated.

The development and mass use of confectionery products made on the basis of plant raw materials of high nutritional and biological value is a promising direction for the solution to the problem of lack of nutrients, which is rare in the diet of the population, and it is important to expand the range of such products.

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## DEVELOPMENT OF TECHNOLOGY TO INCORPORATE DEHYDRATED MURUNGA LEAF POWDER IN PANEER CHEESE

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### Abstract:

**Objective.** Murunga (*Moringa oleifera*) is a popular plant and the leaves and fruits are very famous for food but it is underutilized in Sri Lanka even though it has some functional properties. It has some essential oil fractions which provide functional properties. This study was carried out to develop a technology to incorporate Murunga leaf powder in paneer cheese and analyze the chemical and microbial composition, and its' acceptability using (soft and hard paneer). Preparation of paneer was done in a usual way and citric acid was used as a coagulant for all treatments and treated with 0.50, 1.00, 1.50, and 2.00% of Murunga leaf powder for this experiment named T<sup>1</sup> to T<sub>4</sub> respectively. Sensory analysis was conducted (30 panelists) by using hedonic scale (5-point) to evaluate the acceptance level of Murunga incorporation in paneer.

## CONTENTS

### PRIMARY PROCESSING OF COTTON, TEXTILE AND LIGHT INDUSTRY

<b>N.Khalikova, S.Pulatova</b>	
A research of consumer opinions in forming the important factors of fur garments.....	3
<b>N.Khalikova, S.Pulatova</b>	
Literary analysis new technologies of women's outer clothing from carakul....	9
<b>Sh.Korabayev, H.Bobojanov, S.Matismailov, K.Akhmedov</b>	
Study of aerodynamic characteristics of cotton fiber in separator of pneumo-mechanical spinning machine.....	14
<b>Sh.Korabayev</b>	
Research of the movement of fibers in the confusion between the air channel and the rotor in a pneumo-mechanical spinning machine.....	18
<b>M.Mirsadikov, M.Mukimov, K.Kholikov, N.Karimov, Sh.Mamadjanov</b>	
Analysis of technological parameters and physic-mechanical properties of interlock knitted fabric knitted from cotton-nitron yarn.....	23
<b>M.Mirsadikov, M.Mukimov, K.Kholikov, N.Karimov</b>	
Study of technological parameters and physical-mechanical properties of rib fabric knitted from spinning cotton-nitron yarn.....	32
<b>N.Karimov</b>	
Analytical calculation of the deformation state of the saw gin saw teeth bending under the action of a load.....	38
<b>Z.Ahmedova, A.Khojiyev</b>	
Analysis of headwear and beret in fashion.....	42
<b>N.Khusanova, A.Khojiyev</b>	
Creation of a new model of women's coat.....	51
<b>M.Abdukarimova, R.Nuridinova, Sh.Mahsudov</b>	
Method of designing special clothing based on approval of contamination assessment methodology.....	59
<b>Sh.Isayev, M.Mamadaliyev, I.Muhsinov, M.Inamova, S.Egamov</b>	
Practical and theoretical analysis of the results obtained in the process of cleaning cotton from impurities.....	67
<b>GROWING, STORAGE, PROCESSING AND AGRICULTURAL PRODUCTS AND FOOD TECHNOLOGIES</b>	
<b>D.Saribaeva, O.Mallaboyev</b>	
Scientific basis for the production technology of fruit lozenges (marshmallow)	74
<b>R.Mohamed, K.Serkaev, D.Ramazonova, M.Samadiy</b>	
Development of technology to incorporate dehydrated murunga leaf powder in paneer cheese.....	79
<b>B.Adashev, D.Salikhanova, D.Ruzmetova, A.Abdurahimov, D.Sagdullaeva</b>	
Indicators of blending of refined vegetable oils.....	87
<b>O.Ergashev, A.Egamberdiev</b>	
Choosing acceptable parameters for experiment on new energy-saving vacuum sublimation drying equipment.....	92



<b>A.Eshonto'rayev, D.Sagdullayeva, D.Salihanova</b>	
Determining the effectiveness of soaking almond kernels before processing..	97
<b>CHEMICAL TECHNOLOGIES</b>	
<b>Sh.Kiyomov, A.Djalilov, R.Zayniyeva</b>	
Adhesion of a thermoreactive epoxy waterful emulsion film former on metal..	102
<b>A.Djalilov, Sh.Kiyomov</b>	
Synthesis of a non-isocyanate urethane oligomer based on phthalic anhydride.....	107
<b>T.Abdulxaev</b>	
Water vapor adsorption isotherm on zeolite AgZSM-5.....	114
<b>F.Juraboev, B.Tursunov, M.Togaeva</b>	
Study of the catalytic synthesis of o-vinyl ether based on monoethanolamine and acetylene.....	120
<b>S.Mardanov, Sh.Khamdamova</b>	
Solubility of components in the system NaClO <sub>3</sub> CO(NH <sub>2</sub> ) <sub>2</sub> -NH(C <sub>2</sub> H <sub>4</sub> OH) <sub>2</sub> - H <sub>2</sub> O.....	124
<b>D.Salikhanova, Z.Usmonova, M.Mamadjonova</b>	
Technological basis of activated carbon production process through processing of plum seed waste.....	128
<b>N.Alieva</b>	
Analysis of the effect of adhesive substances on paper strength.....	134
<b>Sh.Rahimjanova, A.Hudayberdiev</b>	
Optimization of heating of mixtures of oil and gas condensate by hot flows of fractions in tubular heat exchangers.....	138
<b>M.Mehmonkhanov, R.Paygamov, H.Bahronov, A.Abdikamalova, I.Eshmetov</b>	
Binding materials for creating coal granules and their colloid-chemical characteristics.....	146
<b>A.Khurmatov, S.Boyturayev</b>	
Analysis of oil dust released during processing of metal surfaces under laboratory conditions.....	152
<b>M.Kalilayev, Sh.Bukhorov, A.Abdikamalova, I.Eshmetov, M.Khalilov.</b>	
Study of foam formation in polymer solutions depending on the content and nature of surfactants.....	159
<b>MECHANICS AND ENGINEERING</b>	
<b>Sh.Pozilov, O.Ishnazarov, R.Sultonov</b>	
Frequency adjustment of well pumping equipment.....	167
<b>H.Kadyrov</b>	
Control of vibration parameters on the tank wall of oil power transformers in operation.....	179
<b>S.Khudayberganov, A.Abdurakhmanov, U.Khusenov, A.Yusupov</b>	
Methodology for assessing the level of train safety.....	185
<b>Sh.Abdazimov, N.Muminjanova</b>	
Use of integrated technologies in vocational education.....	189
<b>M.Uzbekov, O.Bozarov, E.Begmatov, M.Begmatova</b>	
Analytical analysis of the optimal dimensions and energy parameters of the impeller of a nozzle hydraulic turbine.....	196
<b>B.Boynazarov, F.Nasretdinova, M.Uzbekov</b>	

Analysis of solar energy devices.....	<b>205</b>
<b>D.Mukhtarov, R.Rakhimov</b>	
Determining comparative efficiency in composite film solar dryers.....	<b>213</b>
<b>P.Matkarimov, D.Juraev, S.Usmonkhujayev</b>	
Stress-strain state of soil dams under the action of static loads.....	<b>221</b>
<b>A.Khayrullaev</b>	
Microcontroller-based remote monitoring of overhead power lines.....	<b>228</b>
<b>A.Mamaxonov, I.Xikmatillayev</b>	
Design of a resource-efficient chain drive structure for the device drive that distributes the seed in the bunker to the linters.....	<b>237</b>
<b>A.Yusufov</b>	
Analysis of existing methods and approaches to the assessment of residual resources of traction rolling stock.....	<b>243</b>
<b>A.Djuraev, F.Turaev</b>	
Determination of the friction force between the composite feeding cylinder and the fiber rove.....	<b>249</b>
<b>A.Kuziev</b>	
Forecasting the prospective volume of cargo transportation for the development of the transport network.....	<b>253</b>
<b>N.Pirmatov, A.Panoev</b>	
Control of static and dynamic modes of asynchronous motor of fodder grinding devices.....	<b>260</b>
<b>ADVANCED PEDAGOGICAL TECHNOLOGIES IN EDUCATION</b>	
<b>K.Ismanova</b>	
Systematic analysis of the state of control of the technological processes of underground leaching.....	<b>267</b>
<b>K.Shokuchkorov, Y.Ruzmetov</b>	
Analysis in solidworks software of the strengths generated in the underground part of the wagons as a result of the impact of force on the entire wheels of wagons.....	<b>273</b>
<b>A.Yuldashev</b>	
The processes of gradual modernization of the state administration system in uzbekistan over the years of independence.....	<b>278</b>
<b>ECONOMICAL SCIENCES</b>	
<b>O.Khudayberdiev</b>	
Fourth industrial revolution in the textile and garment manufacturing.....	<b>287</b>
<b>N.Umarova</b>	
Methodology for assesment of external factors affecting the financial security of building materials industry enterprises.....	<b>293</b>