



PHYSICAL METHODS OF PLUMS DRYING WITH THE HELP

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ABSTRACT

Development of consulting, marketing services and organization of intensive agro-industrial system based on scientific research, further development of the food industry, increasing the investment attractiveness of the industry and the introduction of modern technologies in the agricultural sector. This is the basis of the policy pursued in our country today. In this regard, a number of measures are being taken at the governmental level to support this sector in the country, to create opportunities for them, and relevant laws and decrees are being signed in this area. Among them is the Resolution of the President of the Republic of Uzbekistan dated July 29, 2019 No PQ-4406 "On additional measures for deep processing of agricultural products and further development of the food industry"

Timely harvesting and quality storage of large quantities of fruits grown in our country is one of the most pressing issues in providing the population with quality food products throughout the year and thereby achieving food security. This imposes huge responsibilities on workers and specialists working in this field, such as the installation of the most modern equipment and tools in processing enterprises, the organization of efficient work processes and their maintenance.

In this regard, this article provides information on the process of osmotic pressure treatment of plum fruits and its advantages, which are important in the quality organization of the processing of products.

Plum is the first stone fruit that is widespread throughout the world and cultivated by mankind. More than 2,000 varieties can be found in large areas in Central Asia, China, Europe, Romania, and the United States.

Due to the components contained in plum fruit, it plays an important role in ensuring human health due to its ability to prevent various diseases. Plum fruit is distinguished from other legumes by its richness in phenolic acid, lutein, cryptoxanthin carotenoids, pectin, organic acids, mineral salts, vitamin complexes A, B, C and K, macro and micro elements. Especially as the fruit ripens, the amount of minerals, aromatic substances in it significantly increases. For this reason, in some folk medicine, plum fruit is also



recommended as a natural remedy for patients for the treatment of cardiovascular diseases, lung cancer, diseases of the digestive system and to strengthen memory [3].

Depending on the varieties of plums, growing conditions and the effectiveness of agro-technical measures, the content of phenolic substances, especially organic and inorganic acids, varies (Table 1).

Table 1

The amount of organic acids and phenolic compounds in plums at the stage of biological maturity.

Acids	Quantity (mg / kg)
Organochloric acid	85-1300 mg / kg
Organochloric acid	13-430 mg / kg
Cryptochloroorganic acid	956 mg / kg
Phenol compounds	Quantity (mg / 100gr)
Cyanide-3 glucoside	1.9-13.5
	1,4-14,4
Cyanide-3 rutinoside	14.1-33.0
	8.9-60.5
Penodinin-3 glucoside	1.1-1.2
	0.3-2.3
Common anthocyanin	926
	125
	76
	18-29

Quantitative and qualitative indicators of organic acids and phenolic compounds in plums at the stage of biological maturity are the most valuable nutrients of plums [3].

In addition to being consumed in large quantities in its freshness, plum fruit is also widely used in drying, canning and preparation of various soft drinks.

Drying plums using sunlight takes decades. However, the growing consumer demand in the world market requires an increase in the quality of the product, its appearance, composition, taste. From this point of view, the identification and improvement of new methods suitable for drying plum fruits, which serve to preserve

all its nutritional and quality properties, is one of the most important issues facing scientists today.

Traditional drying methods show that the skin of plums is wrinkled, subjected to various physical shocks, chemical changes under the influence of high and disproportionate temperatures, and as a result, the violation of organoleptic properties. Therefore, this article describes the technology of organizing the drying using osmotic processing, which saves time, energy, labor and a number of other factors, as well as obtaining a quality product.

For this reason, the decomposition of these compounds and the preservation of their structural structure during the drying of plum fruit are very important



indicators. According to the results of our scientific experience and research, the osmotic drying device we offer is also important in that it has high performance in the process of preserving the most delicate structure and elements in the fruit.

Osmotic dehydration is a measure used to remove fruits by partial immersion in a hypertonic solution using sugar or salt solution in order to reduce the amount of moisture in the tissues before drying. Osmotic dehydration is a process that depends on several factors such as solution concentration, temperature, time, fruit size, tissue density and structure.

In the process of osmotic dehydration plums are poured into a solution with a high concentration. In this process, through the formation of osmotic pressure, the water in the fruit tends to pass into a highly concentrated solution. In this process, due to the fact that moisture is transferred to the highly concentrated solution through the natural pores present in the skin of plum fruit, the process is very smooth and the appearance and color of the fruit is preserved at a very high quality. However, due to the fact that the release of water from the product is a gentle physical process, the decomposition of organic acids, phenolic compounds and a number of other valuable nutrients listed in the plum fruit (Table 1) is prevented.

Based on the conducted experiments, the process of osmotic treatment of plum fruits with different concentrations of various soluble substances was investigated. The experiments were carried out with solutions such as 50% and 65-75% sugar solution, 45-55% fructose, 70%

concentrated sweet syrup at temperatures of 25S °, 30S °, 40S °. According to the analysis of the obtained results, it was found that processing of plum fruits with 60% sucrose solution at a temperature of 40C ° can achieve high efficiency.

In addition, substances such as CaCl_2 , $\text{C}_2\text{H}_5\text{OH}$, lactose, dextrin, NaCl were added to the osmotic solution to further improve the quality of the product. It was found that the dehydration process was carried out quickly and efficiently due to the fact that these substances have the ability to expand without damaging the natural holes in the skin of plum fruit.

In summary, dehydration by processing solutions containing high concentrations of plum fruits has been found to have the following several advantages.

- ❖ Due to the low temperature of the process, the color and appearance of the product are well preserved.
- ❖ Since the process is based on complete physical changes, the decomposition of valuable chemical elements in the plum fruit was prevented.
- ❖ the sourness in plums treated with a high concentration of sugar solution was the basis for the sweetness of the dried product as a result of neutralization of the acidity level.
- ❖ the process was found to be cost-effective in that it did not require any type of energy.

From this point of view, the processing of plum fruits using osmotic pressure ensures that the drying process is carried out quickly and efficiently.



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