THE IMPORTANCE OF THE PROCESS OF PRE-COOLING OF RAW MATERIALS IN INCREASING THE CONSERVATION OF FRUIT AND VEGETABLE PRODUCTS

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ANNOTATION

The use of cold in the storage of agricultural raw materials is increasingly used. This method is based on the use of artificial cold to maintain the vital functions of fruits and vegetables. The article presents the results of pre-cooling of agricultural raw materials. It has been found that the use of pre-cooling increases the shelf life from 6 to 8 months, depending on the product.

Key words: storage, fruit and vegetable products, agro-industrial complex, storage losses, product quality.

The main goal of the socio-economic development of the Republic of Uzbekistan in the long term is to strengthen the position of Uzbekistan in the world, ensure sustainable development and high rates of economic growth, increase the level of well-being and ensure the safety of citizens. Achieving the goal is possible, inter alia, by ensuring the competitiveness of food products, as well as developing the agro-industrial complex and increasing the efficiency of using the resource base.

The food industry of the Republic of Uzbekistan until recently was characterized by a decline in production, a break in production ties, insufficient and ineffective material and technical equipment, but at the same time in modern conditions it has a huge potential, due to the presence in the regions of significant raw material bases and the abundance of agricultural production products.It should be noted that the sphere of processing and storage of agricultural products is the most developed of all branches of the agro-industrial complex, including through the active introduction of innovations.

Government-developed Agricultural Development Program for 2016-2020. determines a number of measures for the transition of the economy from exporting raw materials to an innovative way of development, including by reducing energy intensity, increasing environmental friendliness and modernizing processing industries; increasing the depth of processing of raw materials, expanding our presence on world markets, etc.

An important link in the agro-industrial complex is the system of procurement of agricultural products, designed to timely accept, store and bring agricultural products to the consumer. However, due to the imperfection of the procurement system, significant volumes of fruit and vegetable products do not reach the consumer every year

Storage is the stage of product circulation, which must take place under conditions that ensure a minimum change in its quantity and quality. This issue is currently acquiring great economic importance, since the loss of products in the process of transportation and storage bring significant losses. For example, the annual loss of fruits and vegetables in the country is up to 40% of the gross harvest.

The high quality of the vegetables and fruits sold is largely ensured by the storage technology.When choosing the most acceptable methods of storing fruit and vegetable products, many factors are taken into account - economic efficiency, timing, availability of material and technical base

For the highest quality storage of food throughout the year, the following are necessary: the most effective methods of storing food; properly equipped food storage facilities.

For different goods, the storage problem is solved differently, since each of them needs to be stored in a certain mode, depending on its composition, properties and intensity of the processes occurring in it.

A promising way of long-term storage of agricultural products is their storage with pre-cooling.

The technology provides for cooling vegetables in a short time after harvesting in the field, as well as at the raw material sites of procurement and processing enterprises, pre-cooling and short-term storage modes, methods of loading, stacking, unloading products, quality control are regulated. Reaching the required cooling temperature in 12-14 hours makes it possible to keep freshly harvested products during transportation.

During storage, not only temperature is important, but also the period during which it is reached. After five to eight days, fruits and vegetables should reach storage temperature. Any too late storage or intermediate storage at higher temperatures will reduce the shelf life of the product. Rule of thumb for long-term storage: A day of late or long-term refrigeration can be worth a week of storage.

A universal technology of stage-by-stage cooling of products with an air system has been created, which makes it possible to reduce losses from spoilage and loss of weight up to 5 times during the period of accumulation of raw materials and during their transportation; it has been successfully tested in dehkan-farms of the Fergana region, the Republic of Uzbekistan.

Pre-cooling temperatures set for different crops are shown in Table 1.

Temperature required for pre-cooling of fruits and vegetables

Cultures	Precooling indicators, ° C	Shelf life
Sweet cherry	2	extends shelf life up to 26-90 days
Apricots	3-4	extends shelf life by 15 days
peach	4	
Plums, apples	5-8	-
Grapes	4	As a result, losses from spoilage are reduced by 4 times and the output of standard products increases (for example, the Khusaini variety)

Pre-cooling fruit and vegetable products can be carried out in various ways.The methods depend on the specifics of further use and the volume of raw materials. These can be cold rooms with a low loading density for short-term storage before sale. Conveyor installations and cooling tunnels are often found equipped with air blowing devices providing a flow rate of 0.5-7 m / s. In the United States, differential pressure air cooling is used. The products are placed in a special way into a chamber with a slight overpressure. Air enters the inside of the stack through its bottom plane. The air is taken from the top. A stack with a height of 2-2.5 m completely occupies the volume of the room. The pressure difference makes it possible for the cold air to penetrate directly to the fruit, even in the presence of cushioning material. The construction costs of such installations are higher than with the intensive air method, but there is less chance of uneven cooling. In Europe, for cooling and some humidification of the air, forced ventilation is used through an ice-salt mixture. Cooled air is supplied through special air ducts to the storage chamber or to the refrigerator car to quickly reduce the temperature of the product. At a cooling air temperature of -2 ° C, the cargo is cooled to 4 ° C in 10-12 hours. Mobile devices have

been developed that allow products to be cooled by hydro-irrigation directly in a refrigerator during their delivery from the field to the refrigerator. In this case, it is necessary to add antiseptics to the water.

Sorbic acid solutions and chlorine water can be used as antiseptics.

Thus, the use of pre-cooling in combination with antiseptics for long-term storage of fruit and vegetable products increases the shelf life from 6 to 8 months, depending on the product.

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