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METHODS OF QUICK AND QUALITY DRYING OF FRUIT AND VEGETABLE PRODUCTS

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ABSTRACT:

In our country, great attention is paid to the drying of fruits and vegetables, and as a result, small-sized mini-drying shops are developing rapidly and intensive drying processes are being improved without wasting fruit quickly. Scientists of the Namangan Institute of Engineering and Technology are conducting research on the rapid and high-quality drying of fruits and vegetables. This article provides analytical data for the selection of specific production conditions for fruit and vegetable drying methods.

KEYWORDS: Agricultural products, drying methods, dryer, technology, drying time, air temperature, production line, equipment.

INTRODUCTION:

In our country, great attention is paid to the drying of fruits and vegetables, and as a result, small-sized mini-drying shops are developing rapidly and intensive drying processes are being improved without wasting fruit quickly. The "Strategy of actions on five priority areas of development of the Republic of Uzbekistan for 2017-2021", approved by the Decree of the President of the Republic of Uzbekistan dated February 7, 2017 sets a number of DP-4947,tasks for modernization and accelerated development of agriculture.

In particular, the expansion of research work on the creation of varieties of drought, salt, disease-resistant agricultural crops, adapted to the soil and climatic conditions of the country, the creation of agricultural varieties suitable for different soil and climatic conditions, proving their negative impact on consumer health , the creation of new types of products that can replace exports and imports using local raw materials, and other similar top priorities. At this time, the production of dried agricultural products is becoming increasingly popular.

Therefore, it is important to take measures to quickly harvest fruits and vegetables grown in sunny Uzbekistan without destroying them, because the fruits ripen in hot weather, taking into account the products are sent to the processing industry, including worms. In our country, great attention is paid to the drying of fruits and vegetables, and as a result, small-sized mini-drying shops are developing rapidly and intensive drying processes are being improved without wasting fruit quickly.

Scientists of the Namangan Institute of Engineering and Technology are conducting research on the rapid and high-quality drying of fruits and vegetables. This article provides analytical data for the selection of specific

production conditions for fruit and vegetable drying methods.

By drying hard and paste materials, it is possible to give them properties, transfer them in vehicles and store them for a long time.

Drying can be done in three ways:

1. Mechanical (compression, precipitation, filtration, centrifugation);

2. Physicochemical (using water-absorbing substances, such as calcium chloride, sulfuric acid);

3. Dehydration under the influence of heat, i.e. drying.

The most effective of the above methods is heat dehydration, i.e. drying. This is because complete dehydration can be achieved during the drying process.

In solid and paste materials, the process of evaporating moisture and removing the resulting vapors is called drying.

Heat drying of wet materials is the most common method in industry. This method is used in chemical, food and a number of other technologies. Moisture in the material is initially carried out by inexpensive, mechanical (eg filtration) method, and final, complete dehydration is carried out by drying. Such a combined method of dewatering is cost-effective.

The industry uses artificial (in special dryers) and natural (outdoor drying-very continuous process) methods for drying wet materials.

Depending on the method of heat treatment of hard, wet material, drying is divided into the following types:

1) convective drying - in which the drying conductor interacts directly with the wet material. Usually heated air or smoke gases are used as the drying conductor;

2) contact drying - there is a separating wall between the heat carrier and the wet material. Heat is transferred to the material by this wall;

3) radiation drying - heat is transferred to the wet material by infrared rays;

4) dielectric drying - wet material is stretched in a high-frequency current field;

5) sublimation drying - wet material is dried under high vacuum in the frozen state.

It should be noted that the wet material dried in any drying method often interacts with hot air. Convective drying is widely used in industrial technologies. The effect of hot air on the wet material is of great importance for carrying out this process. Therefore, knowledge of the basic properties of humid air is necessary to study and calculate the drying process.

The mixture of dry air with water vapor is called humid air. Wet air is characterized by parameters such as absolute and relative humidity, wet storage, enthalpy, dry and wet bulb thermometer temperatures, partial pressure.

Absolute humidity is the amount of water vapor (kg) in 1 m^3 of humid air.

If the partial pressure at p_b occupies the whole volume of water vapor, for example 1 m^3, then the absolute humidity is equal to the density of water vapor p_b.

Relative humidity is the ratio of the absolute humidity of the air to the absolute humidity at saturation:

$$\varphi = \frac{\rho_6}{\rho_m}$$

where ρ_m - density of saturated water vapor, kg / m^3; ρ_m - density of water vapor, kg / m^3

Since the partial pressure of vapors in a gas is proportional to its quantity, the relative humidity can be expressed as the ratio of the partial pressure ρ_6 of water vapor in the air at the same temperature and pressure to the saturated water ρ_T vapor pressure:

$$\varphi = \frac{P_б}{P_T} \text{ or } \rho_б = \varphi \cdot \rho_T$$

Wet storage is the amount of water vapor (1 kg) corresponding to I kg of absolutely dry air.

Humidity is determined by the relative humidity retention (kg /kg) or (g /kg). Humidity is determined by the following ratio:

$$x = \frac{m_б}{m_{акх}} = \frac{\rho_б}{\rho_{акх}}$$

where $m_б$ and $m_{акх}$ - water vapor and absolutely dry air masses, kg.

In short, at the private enterprise "AFRUZ KAMOL NABI" we chose the convective drying method for drying fruits and vegetables using artificial dryers. The production line consists of the following order:

1. Transmitter;
2. Fruit and vegetable washing and cleaning equipment;
3. Inspection table;
4. Product dryer

In the drying device, the products are dried at the expense of hot steam (1200 C) (10-25 min). Hot air is blown into the dryer in a large stream and the air temperature in the chambers decreases. This process results in a uniform drying of the products in terms of thickness. Currently, scientific work is underway to eliminate shortcomings in the equipment for separating dried vegetables from the skin. In the future, work will continue to improve the equipment and determine the optimal mode of this private enterprise.

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