

METHODS OF DRYING FRUIT PRODUCTS, TECHNOLOGY AND THEIR PACKAGING

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ABSTRACT

To prevent wastage of fruits, three fruits are processed and dried. It should be dried in a condition that meets the requirements for drying. The selection of packaging containers for dried products is explained in our article.

Keywords: Biochemical processes, tissues, water, physical processes, capillaries, diffusion, vitamins, moisture.

When drying fruits, a large amount of moisture in them is lost. The juice strength and osmotic pressure in the cells increase several times, as a result, the development of microorganisms becomes impossible. As a result of the inactivation of enzymes, biochemical processes stop, and the product becomes preserved. The advantage of dried vegetables and fruits over wet fruits and canned products is that it is also a mistake to transport it. Fruit drying cannot be attributed only to the physical process of moisture evaporation. During drying, complex physical and chemical changes occur that depend on the quality of the finished product. Water in fruits is connected differently with tissues. The free water between the cells evaporates as quickly as the moisture on the outer surface. Moisture in small capillaries evaporates with difficulty because it is held by the adsorptive power of the product.

The drying speed increases when the product heats up. At this time, the moisture between its surface and the large cells in the upper part evaporates. Then the temperature and drying speed in the product are moderated. Drying is observed as the moisture on the surface of the product evaporates, and as a result of the upward movement of water in the internal parts of the product, the concentration in the raw material becomes uniform (internal diffusion of moisture). In addition, reverse diffusion occurs, moving from strongly heated upper layers to slightly heated inner parts (thermal diffusion). When drying at a constant speed, the rate of external and internal diffusion of moisture should be the same. This can be successfully achieved by maintaining the exact temperature for each vegetable and fruit. An excessive increase in air temperature causes uneven external and internal diffusion of moisture, excessive drying of the external parts of the product, and the appearance of crusts and

cracks. Inappropriate changes in the chemical composition - dark compounds appear, taste and aroma change, vitamins C, P, carotene are broken down. The temperature is of great importance, especially in the last period, because hygroscopic and swelling moisture is being lost. Alternative drying procedures have been developed for each type to obtain a high-quality dried product. During drying, a large amount of moisture is lost in a certain time, and the quality of the raw material does not change much. After cooking, the quality of the product approaches the original state.

The speed of drying, the quality of the product depends on the temperature and air speed, the characteristics of the structure and chemical composition of vegetables and fruits, the level of their grinding, placement on the drying surface, and especially the drying method. When using the correct drying technology, the main nutrients in vegetables and fruits are well preserved, and their calorie content increases 10-30 times due to the loss of excess moisture.

The product is dried in two main ways: artificially and naturally. Several types of artificial drying methods are known, including low pressure, spray dryers, and fluid bed drying methods. Sublimation drying is considered a promising method and is based on the loss of moisture in the product under low pressure. In this case, the original substances in vegetables and fruits are kept almost unchanged, and after soaking and thickening, they have properties close to their original state.

Drying fruits in the sun. In Uzbekistan, grapes, apricots, peaches, apples and other fruits, as well as melons, are mainly dried in the sun. Drying can be carried out for a few days in cloudless hot, sunny weather without using excessive fuel and electricity for the technological process. After calibrating the fruits, they are thoroughly washed, then the large ones are divided into four parts, and the small ones are cut into two parts. After removing the middle core and band, cook it in boiling water for 2-3 minutes. After that, it is washed in clean water and smoked. Smoked raw materials are placed on the racks in the drying area and dried in the sun for 4-5 days. After 2-3 days, the fruits are overturned, after which the trays are taken to a shady place and stacked in a certain order. varieties can be stored for a long time because they are resistant to storage. Mostly spilled and non-standard apples are dried. Such products make up 25-50% of the total harvest. Apples of all varieties are harvested. It is possible to prepare high-quality from white and pale yellow apples with more sugar content and more aromatic, fleshy flesh. Drying is mainly carried out by the following me Drying in a simple way, in which the peel of the fruit is not peeled.

French drying, in which the skin of the fruit is removed and the seeds are removed. When dried in this way, the fruits are separated into varieties after picking, washed, cut, peeled, smoked, after drying, they are moistened and stored in boxes. Apples for drying are harvested during technical ripening or 2-3 days before full technical

ripening. During this period, depending on the variety, the sugar content of apples should be 8-16%, and the acidity should be 0.2-1%. Before drying, the sorted apples are washed in washing machines or in baths filled with clean water, and are cleaned of dust and dirt from various microorganisms. After removing the apple skin, it is placed in 2-3% brine. This helps to preserve its natural color. Then it is taken in trays and fumigated with sulfur and cured in sulfur anhydride solution. During smoking, 1.5-2 grams of sulfur are added for every 1 kilogram of apples. Smoking should last 25-40 minutes. Instead, it can be treated with 0.1-0.2% sulfuric anhydride solution for 1-2 minutes. Depending on the drying method, air temperature, and the size of the apples, drying can last from 3-5 to 14-15 days. When peeled and dried, up to 12-15%, when peeled, up to 17-20% of apple peel can be obtained, sugar content can be 43-62, acidity can be up to 1-4%. The moisture content of the dried product should not exceed 20%. In this moisture, the bark becomes elastic, and when crushed, it becomes inflexible. The finished product can be put on sale after 10-15 days of storage in the boxes, i.e. after the moisture level has increased. Apple peel should be stored in a clean, disinfected building at a temperature of 0-10, with an air humidity of 60-65%. Quality apple peel can be obtained mainly from the following apple varieties: Pervenets Samarkandda, Delishes, Zolotoy grayma, Parmen zimniy zolotoy, Grafensteinsky and Osenniyy zolotoy.

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