

THE IMPORTANCE OF THE DRYING METHOD AND INITIAL PROCESSING FOR DRYING APRICOT

Senior lecturer of Termiz State University of Engineering and Agro-Technology

Abdullayev Iloxm Eshqurbonovich.

Senior lecturer of Termiz State University of Engineering and Agrotechnology

Raxmanov Ergash Asadullayevich.

Assistant teacher of Termiz State University of Engineering and Agrotechnology

Amonov Nurbek Muxidinovich.

Abstract. *This article describes the results of the research conducted on the drying of different types of apricots. The experiments were carried out to study the chemical composition of apricots, the quality of the finished product after drying in three different ways, and the duration of drying. As a result of the research, scientifically based conclusions were made.*

Keywords. Apricots, temperature, regime, dry matter, organoleptic assessment, drying method, quality

Enter. More than 4 million tons of apricots are grown every year around the world. Uzbekistan ranks second after Turkey (730,000 tons) in apricot production and more than 660,000 tons are grown. Iran (306,000 tons), Algeria (256,000 tons), Italy (237,000 tons), Pakistan (178,000 tons) and Spain are the next places in production. (125 thousand tons). Apricots contain 87% water, 11% carbohydrates, about 1% proteins and less than 1% lipids. Various micronutrients and vitamins are abundant in plums. The purpose and specific issues of the research. Different methods of drying apricots and their characteristics have been studied. The aim of this study was to study the optimum drying method and drying periods of dried plum fruits. Material and methods. Researches were conducted on the following plum varieties: Yubileynyy Navoi (control), Kursadyk, Arzami, Subkhoni.

The following were studied for the selected varieties: Biochemical composition of the selected varieties was analyzed; Apricot fruits were dried and analyzed in three ways: whole, split into two, and seedless.

1. According to the method of conducting research:

1. Determination of duration and organoleptic assessment of apricot fruit drying in a natural way by dividing the apricot fruit into two halves and without cracking. Determining the drying duration and organoleptic evaluation of apricots whole, divided into two halves, and in the seedless state without cracking in solar battery fan system (QBVT) equipment.

2. Determining the length of drying and organoleptic assessment of apricots in the artificial drying device in whole, divided into two parts, and in the seedless state without cracking.

RESEARCH RESULT AND DISCUSSION

For research, 4 varieties of apricots were selected from fruit trees. Before the drying process, the fruits characteristic of these varieties were analyzed for their biochemical composition. During the analysis, the amount of dry matter, the amount of sugar and the amount of vitamin C calculated from the important parameters for drying were studied (Table 1). Yubileynyy Navoi, Kursadyk, Arzami, Subkhoni varieties selected for experiments are regionalized in Uzbekistan and are grown mainly in the central zones of our country (see Table 1).

During the research period, the biochemical composition of fruits selected as raw materials was regularly analyzed. The highest indicator of dry matter content was observed in the Yubileynny Navoi variety, the three-year average of which was 26.0%, while the lowest indicator was shown in the Arzami variety and was 16.4%. It was also 22.8 and 23.1% in Kursadyk and Subkhoni varieties, respectively..

Sugar is the main part of the dry matter content of apricots. Also, the content of sugar is an important indicator of the organoleptic properties of fresh and dried apricots. During the experiments, the sugar content of Yubileynny Navoi variety, which was selected as a control, was 19.8% in 2019, 20.9% in 2020, and 18.5% in 2021, while the three-year average sugar content was 19.7%.

The lowest level of sugar content was observed in the Arzami variety, the three-year average was 12.5.3%. Also, a three-year average of 17.3% was recorded in the Kursadyk variety.

Experiments were carried out on drying apricot fruit in three different ways - natural, solar battery fan system (QBVT) equipment and artificial drying device. Apricots for drying were placed in three types - with seeds and without seeds. Initially, experiments were conducted to determine the optimal duration of drying when whole dried apricots (see Table 2).

During experiments, Yubileynny Navoi variety, selected as a control, was dried in a natural way. On average, 27.6 kg of ready-dried product was obtained from 100 kg of raw materials when dried in grain form. 28.7 kg of dry product with grain was obtained when dried in the QBVT equipment. Also, when dried in an artificial drying device, 29.8 kg of finished product was obtained. Subkhoni variety had the highest yield of dried apricots, and an average of 28.1 kg of dried apricots was obtained from 100 kg of raw materials in natural method, 28.7 kg in QBVT equipment and 31.0 kg in artificial drying equipment. In particular, when dried naturally, Yubileynny Navoi (control) variety was 27.5 kg in 2019 research, 29.7 kg in 2020 research, In the 2021 research, 25.6 kg of dried product was obtained, with a three-year average of 27.6 kg. During natural drying, an average of 28.4 kg of Kursadyk variety and 26.0 kg of Arzami variety dried product were produced in three years.

Also, the duration of the drying process when whole apricots are dried varies by variety. That is, the process lasted 244 hours in Yubileynny Navoi, which was selected as a control when dried naturally, and was recorded as the shortest duration. The Kursadyk variety took the longest time and was 288 hours. On the other hand, the drying process lasted 260 hours for the Arzami variety, and 252 hours for the Subkhani variety. During natural drying, the air temperature during the day was 30-35°C.

When dried in a solar powered fan tunnel dryer, the process for all varieties was almost 3 times faster. For example, it took 288 hours to dry naturally in Kursadyknavi, and 96 hours in QBVT equipment. The reason for this is that the equipment is adapted to use the sun's rays efficiently and to the maximum. At the same time, the duration of artificial drying for all varieties was 6-8 hours. When the finished product was assessed by organoleptic method, a significantly higher index was noted in artificially dried products compared to other drying methods.

Prior to drying, apricots were split into two stages and dried in a seedless state, yielding unique process performance (see Table 3).

Duration was somewhat shorter when raw apricots were split into two halves and dried pitted. Yubileynny Navoi variety, which was selected as a control for the research, was naturally divided into two phases and dried in the seedless state, on average 22.6 kg of ready-dried product was prepared from 100 kg of raw material.

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-5, ISSUE-2

When three-year indicators were analyzed when dried naturally, the highest productivity was reflected in the Subkhoni variety and 23.5 kg of dried product was obtained. The lowest productivity was recorded in the Arzami variety, the three-year average of which was 21.3 kg.

Dry product yield was slightly higher when dried in the QBVT equipment compared to natural drying. This situation is explained by the short duration of drying. Because the longer the duration of drying, the less amount of dried product due to decomposition as a result of biochemical processes in addition to dehydration. When dried in this way, from 100 kg of raw materials, 23.5 kg of Yubileynny Navoi variety, 24.2 kg of Kursadyk variety

, 22.2 kg of dried product was obtained from the Arzami variety, and 24.5 kg from the Subkhoni variety. These amounts were established based on three-year results processed and averaged.

Artificial drying is one of the fastest methods. Productivity was also the highest among the three drying methods selected for the experiment. In particular, when 100 kg of raw materials were dried, 24.4 kg of Yubileynny Navoi variety, 25.1 kg of Kursadyk variety, 23.0 kg of Arzami variety, and 25.4 kg of Subkhoni variety were prepared.

Also, in the experiments conducted on the duration of drying in the seedless state, dividing the apricot into two stages, the process was of different duration depending on the drying method. It should be noted that when dried in two stages, removing the pulp, the process took less time than when dried whole. That is, the Yubileynny Navoi variety, which was selected as a control when dried naturally, took the least amount of time - 210 hours were recorded. The drying process lasted 248 hours for the Kursadyk variety, 224 hours for the Arzami variety, and 217 hours for the Subkhoni variety. During natural drying, the air temperature during the day was 30-35°C.

And when dried in the QBVT equipment, the duration was reduced by three times. The process lasted 248 hours for the Kursadyk variety when dried naturally, and 83 for the QBVT equipment. The drying process was carried out for 75 hours in Arzaminavi and 72 hours in Subkhoninavi.

It was 82.9 points when dried in QBVT equipment, and 94.6 points when dried in artificial drying equipment. This condition was observed in all varieties tested. It turned out that the reason for this depends on the drying conditions.

That is, the process of drying in natural and QBVT methods is carried out with the help of the sun's temperature, and at night the temperature drops, the humidity in the air increases, and this humidity has a negative effect on the quality of the product. In artificial drying equipment, the heat agent is artificially created and continuously transferred to the product until the end of the process. As a result, the organoleptic properties of the dried product are preserved.

Further experiments were carried out to determine the technological and quality indicators when dried in the state without harvesting, without grain (see Table 4).

During the experiments, Yubileynny Navoi variety, selected as a control, was naturally dried in a seedless state, and an average of 23.2 kg of finished dried product was obtained from 100 kg of raw material. 24.1 kg of dry product was obtained when dried in the QBVT equipment. Also, when dried in an artificial drying device, 25.0 kg of finished product was obtained.

Subkhoni variety had the highest yield of finished product when dried in all methods, and 24.1 kg of dried apricots were prepared in natural method, 25.1 in QBVT equipment and 28.3 kg in artificial drying equipment. In other varieties, the productivity index was higher than in the control. For example, when dried naturally, 23.9 kg of Kursadyk variety, 21.8 kg of Arzami variety, and 23.2 kg of Yubileynny Navoi variety were obtained. 24.8 kg of Kursadyk variety, 22.7 kg of Arzami variety, and 24.1 kg of Yubileynny Navoi variety were prepared when dried in the QBVT equipment.

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-5, ISSUE-2

Productivity in artificial drying equipment is 25.0 kg in Yubileynyy Navoi variety, 25.8 kg in Kursadyk variety, 23.6 kg in Arzami variety, Subkhoni 26.0 kg of finished product was obtained. Also, in the experiments conducted on the duration of drying without harvesting, the process was of different duration depending on the drying method. Natural The process lasted for 227 hours in Yubileynyy Navoi, which was selected as a control when dried. The longest duration was observed in the Kursadyk variety, which was 268 hours, while in the Arzami variety, it lasted 242 hours, and in the Subkhoni variety, it lasted 234 hours. During natural drying, the air temperature during the day was 30-35°C. At night it drops to 20-25°C.

And when dried in the QBVT equipment, the duration was drastically reduced. For example, the process took 234 hours when dried naturally in the Subkhoni variety, and 78 in the QBVT equipment. The drying process was carried out for 80 hours in Arzaminavi, 89 hours in Kursadyknavi, and 76 hours in Yubileynyy Navoinai. As a result of the experiments, it was found that the quality of the finished product when dried apricots depends on several factors, such as the characteristics of the variety, the method of drying and the form of preliminary processing. Also, the speed of the drying process directly depends on several such factors.

The organoleptic characteristics of the fruits of the studied apricot varieties were studied on the basis of the following parameters: appearance, color, taste, aroma and consistency of the flesh. The evaluated indicators were formed in accordance with the specific characteristics of the research object and consumer demand. These indicators are widely used in organoleptic assessment of dried products.

In order to ensure the difference levels of the score scales, we have developed indicators that allow to accurately determine the evaluation level of each point based on the characteristics of the fruit. When summarizing the opinion of experts on each indicator, it is purposefully evaluated at 4 levels, taking into account the coefficient of importance for individual indicators. Here are the indicators of each муҳимлик даражасини бошқасиникидан фарқланиши ҳисобга олинди. For example, for dried apples, the highest coefficient of taste is 6, and the appearance is 3 coefficients. It follows that the taste of the product is twice as important as its appearance.

At the end of the evaluation process, the tasting sheets filled in by the expert commission consisting of 7 people were summarized.

The organoleptic parameters of the dried product also differed depending on the drying method (see Table 6).

Analyzes were carried out during the research years on the organoleptic assessment of the quality of dried apricot products. Annual results were summarized and three-year averages were calculated. When evaluating the quality of products prepared by drying whole apricots with seeds, specific results were noted for each variety. The organoleptic evaluation of the product varied depending on the drying method.

The dried apricot product of the Yubileynyy Navoi variety was evaluated with 75.4 points when prepared naturally. Solar powered and the product dried in the fan-tunnel drying equipment was evaluated with 81 points. Also, the product dried in an artificial drying device was evaluated with 88.1 points. This pattern was repeated in all varieties.

The dried apricot product of Kursadyk variety was evaluated as 76.1 points, 81.8 points, and 88.9 points according to the drying method, while in the Arzami variety, these indicators were 72.0 points, 77.4 points, 84.1 points, and in the Subkhoni variety, 76.9 points, 65.8 points, and 89.9 points.

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-5, ISSUE-2

According to the tested varieties, the highest indicator was observed in the products dried in the QBVT equipment.

Apricots were divided into two parts and dried in the seedless state. When the content of dried products was analyzed, the organoleptic value was higher than that of dried whole. In particular, the product of dried apricots made of the Yubileynny Navoi variety was evaluated with 81.0 points when prepared in a natural way. The product dried in the solar battery fan drying equipment was evaluated with 82.9 points. Also, the product dried in an artificial drying device was evaluated with 94.6.1 points. This pattern was repeated in all varieties.

Kursadyk dried apricot product was evaluated as 83.8 points, 90.1 points, and 97.9 points in sequence according to the drying method, while in Arzami variety these indicators were 80.9 points, 86.9, 4 points, 94.5 points, in Subhoni variety 84.1 points, 90.4 points and 98.3 points.

- The organoleptic parameters of apricots were evaluated very well when they were dried without cracking and without seeds. In the QBVT equipment, slightly lower values of dried products were recorded.

- As a result of research on drying apricots, it can be concluded as follows:

- - The content of dried apricots and high organoleptic indicators depend on the amount of sugar in plum fruits as raw materials. The duration of drying in the grainless state is 25-30% less than in the grain state.

- - The time spent drying apricots in the QBVT equipment is 3 times less and the organoleptic value is higher.

- - When apricots are dried artificially, all the parameters of the finished product are the highest, as well as the process is the most қиска давом этади.

LIST OF REFERENCES

1. Abdullayev I.E., Aramov M.X., Qishloq xo'jalik mahsulotlarini quritish texnologiyasi, Darslik, "Fan ziyosi" nashriyoti. Toshkent, 2023 y. – 332 bet.
2. Aramov M.X., Abdullayev I.E., Qishloq xo'jalik mahsulotlarini quritish texnologiyasi, O'quv qo'llanma, "Ideal press" nashriyoti. Toshkent, 2023 y. – 179 bet.
3. Om Prakash, Anil Kumar. Solar Drying Technology (Concept, Design, Testing, Modeling, Economics, and Environment) Springer Nature Singapore Pte Ltd. 2017 – 640.