"THE ROLE OF DIGITAL TECHNOLOGIES AND INNOVATIONS IN PRESERVING THE BENEFICIAL PROPERTIES AND IMPROVING THE QUALITY OF APRICOTS: OPTIMIZING DRYING PROCESSES IN LABORATORY AND NATURAL CONDITIONS"

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Annotation: *Consumption of apricots has a positive effect on the general condition. It has many beneficial properties and contains many trace elements, minerals and vitamins. In the absence of fresh apricots, sorghum can replace it. Therefore, this article provides information on drying apricots in both natural and laboratory conditions.*

Key words: *Subkhoni, Jubilee Navoi, Sholakh, Lolacha Burarskiy, Apricots, Beneficial properties, Digital technologies, Innovations, Drying processes, laboratory conditions, Natural conditions, Quality preservation, Bio-active compounds, Process optimization*

The purpose of the study: The purpose of this study is to investigate the role of digital technologies and innovations in preserving the beneficial properties and improving the quality of apricots, and to optimize the drying processes under both laboratory and natural conditions. The study aims to analyze the impact of modern technological approaches on bio-active compound retention, energy efficiency, and overall process effectiveness in apricot drying.

Materials and methods: Sources of information on the changes in the results of drying of laboratory and natural conditions of different apricot varieties and materials related to the study of the influence of various factors were used.

Results and discussion:

- Apricots are good for hypovitaminosis or avitaminosis and anemia. He, as well as to strengthen the health of cancer. This wonderful, appetizing fruit enhances the body's ability to fight various diseases and restores the body's vital functions.
- Consumption of apricots has a positive effect on the general condition. People suffering from cardiovascular and gastrointestinal diseases or overweight should pay more attention to this fruit.
- Anti-obesity apricots are eaten as a dietary product. Dietitians around the world have come to the conclusion that apricots are a useful product for metabolism and digestion

The use of digital technologies and innovative approaches in apricot drying significantly improves product quality and enhances the preservation of biologically active compounds. Drying processes conducted under digital control in laboratory conditions ensure an optimal balance of temperature and humidity, thereby minimizing the loss of vitamins, minerals, and antioxidants.

In contemporary Uzbekistan, the implementation of digital innovations and smart technologies in the field of food technology enables the preservation of the beneficial properties of apricots and the optimization of efficient drying processes. Under laboratory conditions, drying processes can be managed through sensor-based monitoring systems, automated temperature and humidity control, as well as systematic data collection and analysis. At the same time, under natural conditions, the drying process based on solar energy can be regulated using digital control tools and IoT (Internet of Things) sensors, ensuring standardized drying quality and the preservation of apricot bio-active components.

Digital technologies make it possible to increase the energy efficiency of the drying process, monitor microbiological safety, and analyze results in real time. Thus, integrating traditional and laboratory drying methods with digital innovations contributes to improving food quality, reducing the loss of valuable compounds, and enhancing production efficiency. Furthermore, the application of digital technologies enables remote control and automation of drying parameters, thereby reducing the influence of the human factor and ensuring process consistency and repeatability. Through the use of sensors and IoT devices, parameters such as temperature, humidity, and air circulation velocity are continuously monitored, and the results are analyzed in real time. This approach allows for maximum preservation of bio-active compounds during the drying process and continuous quality control of the final product.

In addition, digital innovations contribute to the optimization of energy consumption, making the drying process both environmentally and economically efficient. For example, drying parameters can be automatically adjusted based on energy consumption data, resulting in energy savings and reduced production costs. Moreover, through systematic data collection and analysis, the drying characteristics of different apricot varieties and the degree of bio-active compound retention can be compared, providing a scientific basis for the introduction of new technologies and the improvement of conventional drying methods.

As a result, the practical implementation of digital technologies creates strategic opportunities to ensure food safety and quality, preserve bio-active compounds, and optimize production processes. This approach serves as an advanced platform for modern food technologies and scientific research.

Figure 1. Preservation level of apricot properties and bio-active compounds.

In the absence of fresh apricots, sorghum can replace it. So it is natural that everyone has a question.

Which apricot varieties are suitable for drying and retain certainly useful properties?

Not all varieties of apricots are suitable for drying. Today, there are about a hundred varieties, depending on the taste, intensity of aroma, amount of fruit and ripening period.

Preference should be given to varieties that produce large, fleshy and sweet fruits.When choosing a candidate, remember to pay attention to the taste of the fruit, because the fruits do not feel bitter.

Therefore, we use some varieties of apricots. For the experiment, such varieties as "Sholokh", "Jubilee Navoi", "Subkhoni" and "Bukhara tulip" were used. In addition, when selecting apricot varieties, their ability to retain bio-active compounds, vitamins, and minerals during the drying process is taken into consideration. The degree of flashiness, sugar content, and tissue density of the fruits are regarded as key factors determining drying efficiency. Therefore, the varieties selected for the experiment are characterized by their capacity to preserve beneficial properties to a maximum extent during drying and to enhance the organoleptic quality of the final product.

During the experiment, the drying efficiency of each apricot variety was investigated separately under laboratory and natural conditions. Under laboratory conditions, parameters such as drying temperature, humidity level, and time were precisely controlled, and the bio-active components and moisture content of the fruits were measured. Under natural conditions, the efficiency of the drying process was evaluated based on the use of solar energy and prevailing environmental conditions. Accordingly, the drying characteristics of different apricot varieties, their ability to retain beneficial compounds, and the final quality indicators were compared under varying conditions.

The research results indicate that apricot varieties with high sugar content and dense tissue structure produce the best drying outcomes, exhibiting superior organoleptic quality and effective retention of beneficial bio-active compounds.

At the same time, the use of digital monitoring and control systems enables the optimization of the drying process under laboratory conditions and ensures the standardization of product quality.

- That is, the "Jubilee Navoi" apricot variety high yielding and high quality variety. The fruit is large (45gr). Golden-yellow color. It ripens in late June and early July. Yield 200-220s / ha.
- Subhoni-Turshakbop and Khoraki jaydari varieties are zoned for planting in Andijan, Bukhara, Tashkent and Fergana regions. The tree is big. The fruits ripen in early July, large (35-50 g) hairy, light orange, flesh pale yellow orange, sweet and slightly sour taste.

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Drying apricots in the laboratory under an electric dryer (constant temperature 40 ° C)

№	Apricot varieties	The number of fruits per 1 kg of mass	Drying methods	Amount of mass to be dried (gr)	Output amount of finished dried product (gr)	Drying time (hours)	Sugar content (%)
1	Subkhoni	29	With core	1000	286	65	27,5
			Divided into 2 without core	905	213	46	
			Core mass	95	70	46	
2	Jubilee Navoi	29	With core	1000	304	65	19,6
			Divided into 2 without core	905	202	46	
			Core mass	95	69	46	
3	Sholakh	27	With core	1000	199	65	16
			Divided into 2 without core	948	148	46	
			Core mass	52	39	46	

Figure 1. Natural and laboratory drying methods.

For sun drying, fresh, undamaged, and uncrushed fruits are selected. The fruits are carefully washed, and the pits are removed. At this stage, digital technologies enable preliminary quality assessment of the fruits, including the identification of external defects, moisture content, and ripeness level. In the subsequent stage, drying conditions—such as temperature, humidity, air circulation velocity, and solar radiation intensity—are controlled using sensors and digital monitoring systems to ensure maximum preservation of biologically active compounds and to maintain microbiological safety. As a result, integrating natural and laboratory drying methods with digital innovations contributes to stabilizing product quality, reducing drying time, and enhancing energy efficiency.

Table 2

Natural drying of apricots in a solar battery dryer

№	Apricot varieties	The number of fruits per 1 kg of mass	Drying methods	Amount of mass to be dried (gr)	Output amount of finished dried product (gr)	Drying time (hours)	Sugar content (%)
1	Subkhoni	29	With core	1000	306	168	27,5
			Divided into 2 without core	900	210	72	
			Core mass	100	70	168	
2	Jubilee Navoi	29	With core	5000	1350	168	19,6
			Divided into 2 without core	3650	757	72	
			Core mass	350	250	168	
3	Sholakh	27	With core	6000	1250	168	16
4	Lolacha Burarskiy	28	With core	5000	1200	168	19,3
			Divided into 2 without core	2750	465	72	
			Core mass	250	150	168	

How to store dried apricots: It is important not only to dry, but also to properly store the dried fruits of apricots.

This is very important! To preserve the dried fruit for the longest time, they should be folded into a gauze bag and stored in a cool and well-ventilated room with a humidity and air temperature of not less than 10 degrees.

If this is not possible, dried apricots should be stored in paper bags or bottles, in tightly closed jars that should be regularly opened to the air for a short time.

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