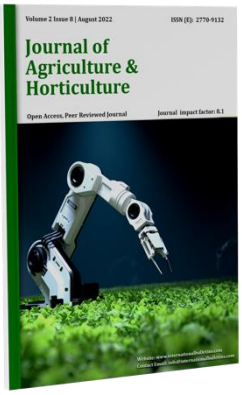

EFFECTS OF CLEANING METHODS AND STORAGE CONDITIONS ON THE AMOUNT AND STRUCTURE OF NATURAL LOSS OF SUNBERRY FRUITS

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Abstract: this article presents the results of a study conducted to study the effect of cleaning methods and storage conditions on the amount and structure of natural loss of sunberry fruits.

Key words: cleaning methods, storage conditions, sunberry fruits, natural loss.

When processing different crops, it is important to know their effective storage time in raw material areas, warehouses and refrigerators. Many crops cannot maintain their high nutritional and commercial qualities for a long period of time and therefore need immediate processing or processing after a short period of storage. During storage, plant raw materials can be affected by microbiological diseases and lose weight due to natural loss. The natural loss of mass consists of the evaporation of water and the consumption of dry matter for respiration. Evaporation of water with fruits and vegetables during storage can have the most negative effect on the normal course of metabolic processes. With intensive evaporation of water, cell turgor weakens, which in turn can cause tissue wilting. Drying increases the decomposition processes of all organic substances in the cell and disrupts the energy balance, as a result of which the nutritional value decreases and the resistance of fruits and vegetables to microbiological diseases is significantly reduced. In the Russian literature, there is no scientific information about the preservation of Sunberry night fruits.

It is known that most of the natural loss of fruits and vegetables during storage is due to evaporation of water and consumption of dry matter during respiration. Therefore, the relative dry matter content often increases at the end of storage of fruits and vegetables under conditions significantly different from optimal humidity and temperature. These conditions should be taken into account when determining the dynamics of dry matter during storage of fruits, vegetables and other watery products.

In our experiments, the value of natural loss depended on the harvesting methods of Sunberry (ripe fruits or fruits separated from the brushes, cut with brushes) and storage conditions (refrigerated or uncontrolled conditions) (Table 1). The obtained data show that when stored in the refrigerator, the amount of natural weight loss was higher in the storage variants of fruits without inflorescences (brushes) during the entire storage period.

Table 1. Values of natural weight loss during storage of sunberry fruits, % (3-year average)

Storage conditions	Options	Storage period, week					
		1	2	3	4	5	6
Cold storage	With tubes	1,40	2,99	5,18	6,97	8,07	9,49
	Without tubes	1,63	3,28	5,42	7,67	9,08	11,07

Uncontrolled conditions	With tubes	3,01	5,94	9,68	12,79	19,31	-
	Without tubes	2,17	4,29	7,84	12,26	16,87	-

At the same time, during the first three weeks, the difference between the storage options was insignificant and was 0.23, 0.29 and 0.24%, respectively, and began to increase significantly from the 4th week of storage. Thus, by extending the shelf life to 4, 5, and 6 weeks, the difference between the options increased to 0.70, 1.01, and 1.58%, respectively. It should be noted that during the entire period of cold storage, fruits of all variants maintained high commercial quality and turgor. Slight loss of turgor during refrigerated storage only began to show at the end of the 5th week.

When stored at 16-18°C and HOV at 50-70% under uncontrolled conditions, the natural weight loss was higher than when stored in a refrigerator. In a normal room, natural decline was less in the variant - fruits without inflorescences. In this variant, during 5 weeks of storage, the natural loss was lower by 0.84, 1.65, 1.84, 0.53 and 2.44%, respectively, than in the variant stored with inflorescences. The high value of natural loss in the option of storage with inflorescences is explained by the fact that the low density and good circulation of sufficiently dry and warm air contributed to a stronger evaporation of moisture. When stored in a normal room, small losses of turgor began to appear when a natural weight loss of 8-9% was achieved after 3 weeks of storage.

Table 2. Structure of weight loss during storage of sunberry fruits, %

Storage conditions	Option	Dry matter content, %			Weight loss, %		
		before storage	After storage		total	Including	
			plan	fact		evaporation of water	dry matter intake
Cold storage	With tubes	13,38	13,05	14,29**	9,49**	9,16	0,33
	Without tubes	13,38	13,18	14,59**	11,07**	10,87	0,20
Uncontrolled conditions	With tubes	13,38	12,24	13,80*	12,79*	11,65	1,14
	Without tubes	13,38	12,20	13,70*	12,26*	11,08	1,18

*- Validity period - 4 weeks; * * - Validity period -6 weeks

Studies have shown that the amount of natural loss and its structure depend more on storage conditions than on cleaning methods. The data presented in Table 15 show that the natural weight loss when stored in cooling chambers for 6 weeks was 1.19% less than in the conventional room for 4 weeks with inflorescences and for 3.3 weeks in the version without inflorescences. During 6 weeks of storage in the refrigerator, fruits evaporated less water and

consumed less dry matter for respiration than during 4 weeks of storage in a normal room. Thus, during storage in the refrigerator for 6 weeks, the evaporation loss of moisture was 0.21% and 2.49% lower than the 4-week storage in a normal room, and the loss of dry matter was 0.98 and 0.81% lower without inflorescences and with inflorescences, respectively. in the version. The least weight loss is to store sunberry fruits in the refrigerator, in the version with cut inflorescences.

The analysis showed that Sunberry fruits had a very high nutritional value after 4 weeks (16-18 ℃ and 5070% RH) and 6 weeks in the refrigerator (3-4 ℃ and 70-80% RH). After storage, sunberry fruit contains a large amount of solid (13.70-13.80% when stored in a normal room and 14.29-14.59% when stored in a refrigerator) and anthocyanins (897.5 - 900.5 mg/100 g when stored in a refrigerator and 885.5-887.5 mg/100 g when stored in a refrigerator ordinary room). The antioxidant activity of fruits increased from 244.0 mg/100 g at the beginning of storage to 250.8-279.3 mg/100 g when stored in uncontrolled conditions, and to 322.3-331.1 mg/100 g when stored in a refrigerator.

Table 3. Biochemical parameters of sunberry fruits before and after storage

Storage conditions	Options	Dry matter, %	Carbohydrate, %			Titrated acid, %	Ascorbic acid, mg/100 g	Anthocyanins, mg/100 g	Antioxidant activity, mg/100 g
			monosaccharide	Disaccharide	Total				
Before storage	Control	13,37	0,73	1,28	2,01	0,98	48,20	900,0	244,0
Cold storage	With tubes	14,29	0,24	0,40	0,64	0,84	33,88	887,5	322,3
	Without tubes	14,59	0,22	0,28	0,50	0,78	35,64	885,5	331,1
Uncontrolled conditions	With tubes	13,80	0,24	0,11	0,35	0,79	46,64	897,5	250,8
	Without tubes	13,70	0,20	0,10	0,30	0,72	50,60	900,5	279,3

It should be noted that the sugar content decreased significantly in all storage options (from 2.01% at the beginning to 0.30-0.64% at the end of storage). At the same time, the amount of sugar is 3.1-4.0 times for 6 weeks in cold storage and 5.7-6.7 times for 4 weeks in a normal room. Sunberry fruits contained different amounts of ascorbic acid after storage. If after 4 weeks of storage in uncontrolled conditions, the content of ascorbic acid was at the level of initial values (46.64-50.60 mg/100 g), then after 6 weeks of storage in the

refrigerator, its content decreased from 48.20 mg/100 g to 33.88- decreased to 35.64 mg/100 g. The titrated acidity of sunberry fruits changed slightly and remained high in all studied options at the end of storage - 0.72-0.84%.

Conclusion

Comprehensive studies have been conducted to improve the elements of the technology for growing, storing and processing the fruits of the Sunberry nightshade. The raw material base of the processing industry has been expanded by using non-traditional plant raw materials with a high content of biologically active, mineral and coloring substances. The range of functional products and natural food anthocyanin dyes has been expanded.

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