THE YIELD AND QUALITY OF DRIED PRODUCE OF MELON VARIETIES DEPENDING ON DRYING METHODS

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Abstract

The article presents the results of a study of the growth, yield and quality of the fruits of melon varieties in the conditions of newly irrigated typical gray earth soils, as well as the yield, biochemical composition and quality of the dried produce of the studied varieties with various drying methods.

It was revealed that the highest (26.9-36.8 t/ha) and high-quality (with a dry matter content in fruits of more than 14.0%, sugars - 12.0%) was obtained from summer varieties of melon Toshloki-862, Novotkalla, L-152, Kuk tinni-1087, Kundalang tur, Ok novvot, Obi novvot Samarkand local, Lazzatli, Oltin vodiy, Sahovat, Tuyona, Ich-kizil, Dilhush, Ok kovun-557, Kukcha-588.

When drying melon varieties by the method of the solar dryer, the yield of dried products (melons) in relation to the pulp was 8.3-13.6%, the highest yield (10.4–13.6%) of dried products (melons) was obtained from Kundalang tur varieties, Toshloki-862, Ok novvot, Kuk tinni-1087, Ok urug-1157, Novotkalla, Kukcha-588, Tuyona, Sahovat, Oltin vodiy, Lazzatli, Shakarpalak-554, Ok kovun-557, Dilhush, Obi novvot Samarkand local, at the same time the yield of dried products (melons) was 2.71-4.11 t/ha. In the artificial drying method, the yield of dried produce (melon) by grades was 9.0-14.7%, and the highest yield (12.0-14.7%) of dried produce (melon) was obtained from the above grades and the yield was 3.40-4.73 t/ha.

In the composition of dried products (melons) with an artificial method of drying, the content of dry matter (0.5-1.1%), sugars (0.6-2.8%), and vitamin C was higher in comparison with the solar method (2, 40-4.60 mg /%) and was rated 0.5-1.1 points higher.

Keywords: Melon varieties, drying methods, yield, marketable yield, biochemical composition of fruits and dried products, organoleptic evaluation.

Introduction

Studies on the cultivation of melon varieties and their suitability for drying were carried out by scientists J.-M. Lee et al [2008], VV Korinets, T. A. Sannikova, V. N. Samodurov [2006], T. A. Sannikova [2009], M. Sabovics et al [2019], Z. S. Seitov, B. J. Jappasov, B. B. Barakbaev [1988]; E. U. Tayshibaeva, J. J. Mamurbekov, H. H. Jumabek [2013]; N. K. Kalabaev, A. A. Tasov, L. Kh. Em [2006], Dj. A. Tolikhov, T. A. Akhmedov, Z. Imamkulova [2013], and in our republic N. N. Balashev [1975], R. F. Mavlyanova, A. Rustamov, R. A. Khakimov, A. S. Khakimov and others [2005], H. Ch. Buriev [1998], R. A. Khakimov [2016], R. T. Makhamadjanov [1990], T. E. Ostonakulov [2010].

However, studies on the growth, yield and quality of melon fruits in the conditions of newly irrigated typical gray earth soils, as well as the yield, yield, biochemical composition and quality of dried products with various drying methods were not carried out sufficiently.

The purpose of the research was to study the growth, development, yield and biochemical composition of the harvest of summer soft and hard pulp melon varieties under conditions of newly irrigated typical gray-earth soils; assessment of melon varieties for suitability to various drying methods (solar and artificial drying), as well as determination of the quality indicators of the dried products (melons) of melon varieties obtained by various drying methods.

Materials and methods

Field experiments were carried out under the conditions of newly irrigated typical gray-earth soils of the farm "Abulkhayir dalasi" in the Gallyaaral district of the Jizzakh region. The object of research was 30 varieties of melon, 2 drying methods (solar and artificial drying).

All censuses, observations, analyzes were carried out according to generally accepted methods and recommendations [1992; 2003; 2011; 1985; 1974].

The biochemical composition in fruits and dried products of dry melon varieties was determined using a Pol-1 refract meter, sugar using the cyanate method, vitamin "C" using the I. K. Murry method, and nitrates using a disulfophenolic acid [1987]. The data obtained as a result of the research were subjected to statistical processing using Microsoft Excel programs and the dispersion method according to B. A. Dospekhov [1985].

To study the yield and quality of dried products of various varieties of melon, 10 pieces of ripe fruits were selected from each variety. Preparation of ripe melon fruits for drying consists are washing the melon, drying it, weighing it and cutting it in half along with a knife. Seeds and placenta (core) are removed from the inside, immediately weighed. Then each half is divided across into slices in the form of segments with an equal thickness of 2-3 cm and at the same time the peel of the melon is removed and weighed. In this case, the yield of pulp and the fraction of the core and peel are determined according to the experimental variants and grades. After that, slices of melon pulp are placed evenly in one layer on a

stainless steel or aluminum wall. When the drying method is solar, the grid with slices is placed on the rack in 4-5 layers (height between layers 50-70 cm) closed (covered) with a transparent film. The drying time is 7-12 days.

In artificial drying, cut melon slices are placed in one layer on a stainless steel or aluminum mesh drying chamber (GU-KSK-15) of a belt conveyor and the chamber is heated. The drying process is carried out sequentially at the first 3.45-4.00 hours at $t^0 = 50^0C$, 3.55-4.00 hours at $t^0 = 60^0C$, 35-40 minutes at $t^0 = 50^0C$ and 3 hours 30-35 minutes at $t^0 = 40^0C$, 7.45-9.15 hours in total.

The readiness of the product is determined organoleptically, the finished melon slices have a light-yellow color, a good dried crust and a soft texture inside.

Research results and discussion

It was established that after sowing early and medium early varieties of melon, seedlings appeared on the 7th-9th day, the first true leaf on the 13-18th day after the emergence, in mid-ripening varieties 2-3 days later, and the fruiting-ripening period was extended by 2 -10 days, in the studied early varieties the vegetation period was 73-80, mid-early varieties 81-91, mid-ripe varieties 90-106 days.

The studied varieties had a significant difference in growth and development, in terms of fruit elements and productivity, the longest stem (235.2-320.8 cm), the largest number of stems (3.9-13.3 pieces) and bushiness (10.6 -20.4 don), leaf surface area (2590-2904 dm^2), bush thickness (1892-2026 g) and root mass (123.1-194.0 g), early varieties stood out - Toshloki-862, Kuk Kalla Push; mid-range - Novotkalla, L-152, Kuk tinni-1087, Ok urug-1157, Ok novvot, Kundalang tur, Obi novvot Samarkand local; mid-season - Lazzatli, Oltin vodiy, Sahavot, Ok Kovun-557, Shakarpalak-554, Tuyona, Ich-Kizil.

Productivity varieties ranged from 17.1 to 37.3 tons per hectare. The highest (26.9-36.8 t/ha and high-quality fruit with a dry matter content of more than 14.0%, sugars - 12.0%) was obtained from the summer melon varieties Toshloki-862, Novotkalla, L- 152, Kuk tinni-1087, Kundalang tur, Ok novot, Obi novot Samarkand local, Lazzatli, Oltin vodiy, Sahovat, Tuyona, Ich-kizil, Dilkhush, Ok kovun-557, Kukcha-588 **(Table 1)**.

The studied melon varieties differed in the mass of the pulp of the fetus, peel and placenta + seeds, in the context of varieties the pulp of the fetus was 79.7-86.0%, peel 9.4-16.4%, and the placenta + seeds 2.4-5. 5%, the highest yield of fruit pulp (81.2-86.1%) was observed in the varieties Gurlan, Kukcha-588, Iskandar pechak, Kuk tinni-1087, Ich-Kizil, Amiri, Doniyori, Obi novvot Samarkand local.

When drying melon varieties with a method of the solar dryer, the yield of dried products (melons) with respect to pulp was 8.3–13.6%, the highest yield (10.4–13.6%) of dried products (melons) was obtained from Kundalang tur varieties, Toshloki-862, Ok novvot, Kuk tinni-1087, Ok urug-1157, Novotkalla, Kukcha-588, Tuyona, Sakhovat, Oltin vodiy,

Lazzatli, Shakarpalak-554, Oak kovun-557, Dilhush, Obi novvot Samarkand local, at the same time the yield of dried products (melons) was 2.71-4.11 t/ha.

Table 1. Productivity and biochemical composition of melon fruit (2016-2018 y)

№	Name of the variety	Productivity, t/ha	Biochemical composition			
			dry matter, %	sugar,%	vitamin C, mg/%	nitrates, mg/kg
	In early ripening varieties (70-80 days)					
1.	Kuk Kalla Push (st.)	23,1	11,9	9,1	12,10	34,12
2.	Buri-kalla	21,4	13,2	9,7	13,64	30,64
3.	Dahbedi	22,7	12,7	9,7	13,20	28,24
4.	Toshloki - 862	28,2	14,2	12,1	15,78	35,88
	In medium early varieties (81-90 days)					
5.	Obi novvot Samarkand local (st.)	26,1	12,3	9,5	18,52	37,60
6.	Amiri	23,4	11,5	9,1	15,10	32,11
7.	Kundalang tur	27,8	14,3	12,9	14,85	27,14
8.	Doniyori	18,9	12,1	10,2	16,70	25,13
9.	Ok novvot	27,2	13,7	12,4	14,64	36,40
10.	Kuk tinni - 1087	30,4	14,0	12,1	17,25	42,86
11.	Ok urug - 1157	25,7	13,8	12,2	16,10	28,74
12.	L - 149 (Novotkalla)	33,0	14,2	12,5	18,84	35,48
13.	L - 152	30,6	14,0	12,1	12,50	44,12
14.	Xujabilmas	17,1	9,7	8,0	11,92	35,74
	In mid-ripening varieties (91-110 days)					
15.	Kukcha - 588 (st.)	28,4	12,7	10,0	20,48	42,72
16.	Tilma	24,6	11,6	8,6	18,60	46,14
17.	Iskandar pechak	18,5	12,2	8,8	17,34	38,20
18.	Ich - kizil	32,3	14,0	11,8	24,72	43,86
19.	Korakosh	20,4	12,1	10,5	21,67	49,13
20.	Xorazm kirkmasi	17,7	12,4	11,2	24,16	34,74
21.	Tuyona	32,8	14,6	12,4	22,00	41,25
22.	Gurlan	21,4	11,2	10,2	23,45	29,27
23.	Shirali	26,5	14,0	12,2	20,14	38,65
24.	Dilhush	30,6	14,2	12,1	23,70	47,10
25.	Sahovat	34,9	14,2	12,2	22,34	53,58
26.	Oltin vodiy	36,4	14,2	13,1	18,88	46,20
27.	Lazzatli	37,3	14,1	12,6	20,40	37,86
28.	Ok kovun - 557	28,5	13, 8	12,0	15,65	42,55
29.	Olcha	25,7	13,2	10,0	24,18	47,82
30.	Shakarpalak - 554	27,4	14,3	12,6	27,36	36,27

With the artificial drying method, the yield of dried products (melon) by grades was 9.0-14.7%, the highest yield (12.0-14.7%) of dried products (melon) was obtained by the above grades and the dried crop production (melon) amounted to 3.40-4.73 t/ha **(Table 2).**

Table 2. Yield and amount of dried products of melon varieties with various drying methods (2016-2018 y)

№	Name of the variety	The yield of dried products in relation to pulp			
		With solar dryer		Artificial dryer	
		t/ha	%	t/ha	%
	In early ripening varieties (70-80 days)				
1.	Kuk Kalla Push (st.)	2,40	10,4	2,59	11,2
2.	Buri-kalla	2,10	9,8	2,38	11,1
3.	Dahbedi	2,07	9,1	2,25	9,9
4.	Toshloki - 862	3,44	12,2	3,78	13,4
	In medium early varieties (81-90 days)				
5.	Obi novvot Samarkand local (st.)	2,71	10,4	2,92	11,2
6.	Amiri	2,22	9,5	2,50	10,7
7.	Kundalang tur	3,78	13,6	4,09	14,7
8.	Doniyori	2,00	10,6	2,17	11,5
9.	Ok novvot	3,05	11,2	3,29	12,1
10.	Kuk tinni - 1087	3,59	11,8	3,95	13,0
11.	Ok urug - 1157	2,72	10,6	2,96	11,5
12.	L - 149 (Novotkalla)	3,86	11,7	4,32	13,1
13.	L - 152	3,24	10,6	3,52	11,5
14.	Xujabilmas	1,42	8,3	1,54	9,0
	In mid-ripening varieties (91-110 days)				
15.	Kukcha - 588 (st.)	3,21	11,3	3,52	12,4
16.	Tilma	2,26	9,2	2,46	10,0
17.	Iskandar pechak	1,72	9,3	1,85	10,0
18.	Ich - kizil	2,94	9,1	3,33	10,3
19.	Korakosh	1,98	9,7	2,24	11,0
20.	Xorazm kirkmasi	1,84	10,4	2,07	11,7
21.	Tuyona	4,03	12,3	4,43	13,5
22.	Gurlan	1,95	9,1	2,14	10,0
23.	Shirali	2,73	10,3	2,94	11,1
24.	Dilhush	3,30	10,8	3,67	12,0
25.	Sahovat	3,98	11,4	4,36	12,5
26.	Oltin vodiy	4,11	11,3	4,73	13,0
27.	Lazzatli	4,18	11,2	4,51	12,1
28.	Ok kovun - 557	3,05	10,7	3,28	11,5
29.	Olcha	2,62	10,2	2,83	11,0
30.	Shakarpalak - 554	3,15	11,5	3,40	12,4

Table 3. Biochemical composition and quality of dried products of melon varieties depending on drying methods (2016-2018 y)

№	Name of the variety	Biochemical composition of dried melon,%						Product quality assessment, in points	
		With solar dryer			Artificial dryer				
		dry matter, %	sugar, %	vitamin C, mg/%	dry matter, %	sugar, %	vitamin C, mg/%	solar dryer	artificial dryer
	In early ripening varieties (70-80 days)								
1.	Kuk Kalla Push (st.)	81,4	62,9	25,0	81,9	65,4	27,4	8,0	9,1
2.	Buri-kalla	80,2	61,5	18,3	80,6	63,1	20,7	8,5	9,3
3.	Dahbedi	81,3	64,4	24,6	81,9	65,7	25,5	8,5	9,4
4.	Toshloki - 862	81,6	65,2	36,4	81,8	66,6	40,2	8,6	9,7
	In medium early varieties (81-90 days)								
5.	Obi novvot Samarkand local (st.)	82,8	65,3	23,4	83,3	66,1	24,2	8,8	9,8
6.	Amiri	82,5	63,0	17,8	82,8	62,8	18,5	8,6	9,5
7.	Kundalang tur	84,1	66,4	28,9	84,5	67,7	30,2	8,4	9,3
8.	Doniyori	82,4	64,2	19,1	83,0	65,5	20,3	8,5	9,6
9.	Ok novvot	83,3	67,3	38,7	84,2	68,1	40,4	8,3	9,5
10.	Kuk tinni - 1087	84,5	64,2	23,8	84,8	64,7	24,3	8,3	9,4
11.	Ok urug - 1157	85,4	65,6	34,6	86,7	67,8	37,5	8,5	9,5
12.	L - 149 (Novotkalla)	83,7	63,4	31,9	84,2	64,6	33,8	8,5	9,7
13.	L - 152	81,5	61,7	46,5	82,0	63,2	44,1	8,2	9,4
14.	Xujabilmas	80,8	59,8	16,8	81,3	60,7	18,6	8,4	9,0
	In mid-ripening varieties (91-110 days)								
15.	Kukcha - 588 (st.)	82,1	63,7	27,2	81,0	64,3	31,3	9,0	9,9
16.	Tilma	82,6	65,2	35,1	83,2	68,0	36,5	8,1	9,0
17.	Iskandar pechak	82,0	62,6	30,3	82,6	63,2	32,5	8,2	9,0
18.	Ich - kizil	81,4	67,8	46,2	81,9	68,5	49,0	8,1	8,9
19.	Korakosh	81,1	64,6	14,9	81,8	66,1	15,4	8,0	9,1
20.	Xorazm kirkmasi	82,5	66,2	19,2	83,0	67,8	20,8	8,4	9,5
21.	Tuyona	83,2	65,5	28,6	83,7	66,3	29,6	7,8	8,7
22.	Gurlan	82,0	64,1	36,2	82,4	65,5	38,1	7,9	8,5
23.	Shirali	83,6	69,3	45,8	83,8	70,4	47,9	8,3	9,2
24.	Dilhush	83,9	67,6	53,1	84,0	69,4	56,0	8,5	9,4
25.	Sahovat	82,5	66,8	44,7	82,8	68,3	45,1	8,3	9,3
26.	Oltin vodiy	82,9	65,6	38,2	83,1	67,2	40,8	7,9	8,6
27.	Lazzatli	82,4	69,4	32,4	83,0	71,4	35,3	7,5	8,3
28.	Ok kovun - 557	82,7	68,6	45,0	83,0	70,0	49,6	7,7	8,6
29.	Olcha	83,3	67,2	26,1	83,5	69,3	29,3	7,5	8,0
30.	Shakarpalak - 554	82,8	68,4	37,4	83,3	70,4	39,7	8,1	9,2

In the composition of dried products (melons) with an artificial drying method, the content of dry matter (0.5-1.1%), sugars (0.6-2.8%), vitamin "C" was higher than the helium method (2, 40-4.60 mg /%) and these indicators, respectively, amounted to 80.6-86.7%, 60.7-71.4% and 15.4-56.0 mg/%, while organoleptic assessment was noted advantage in the quality of dried products (melons) during the artificial drying method compared to the solar method, it was of high quality and environmental cleanliness and was rated 0.5-1.1 points higher **(Table 3)**.
The highest quality (8.5–9.9 points) dried products (melons) were obtained from the varieties Toshloki-862, Daxbedi, Storm calla, Kuk calla push, Obi novvot Samarkand local, Amiri, Kundalang tur, Doniyori, Oak novvot, Kuk Tinni-1087, Ok urug-1157, Novotkalla, Kukcha-588, Tilma, Ich-Kizil, Tuyona, Shirali, Dilhush, Sahovat, Oltin Vodiy, Ok Kovun-557, Shakarpalak-554. It was confirmed that the dried products (melons) of these varieties are free from pathogenic microorganisms (E. coli, Salmonella and mold), they do not contain heavy metals (lead, mercury, cadmium, antimony, copper, zinc) and the amount of radionuclides (cesium-137, strontium-99) is much lower than the recommended maximum allowable standards.

Conclusions

1. The highest (26.9-36.8 t / ha) and high-quality (with a dry matter content of more than 14.0% in sugars, 12.0% of sugars) commodity crop was obtained from the summer varieties of Toshloki-862 melon, Novotkalla, L-152, Kuk tinni-1087, Kundalang tur, Ok novvot, Ob novvot Samarkand local, Lazzatli, Oltin vodiy, Sahovat, Tuyona, Ich-kizil, Dilhush, Ok kovun-557, Kukcha-588.
2. When drying melon varieties with a solar method, the yield of dried produce (melon) with respect to pulp was 8.3–13.6%, the highest yield (10.4–13.6%) of dried produce (melon) was obtained from varieties Kundalang tur, Toshloki-862, Ok novvot, Cook Tinni-1087, Ok urug-1157, Novotkalla, Kukcha-588, Tuyona, Sahovat, Oltin Vodiy, Lazzatli, Shakarpalak-554, Ok Kovun-557, Dilhush, Obi novvot Samarkand local, while the yield of dried products (melons) amounted to 2.71-4.11 t / ha. In the artificial drying method, the yield of dried produce (melon) by grades was 9.0-14.7%, and the highest yield (12.0-14.7%) of dried produce (melon) was obtained from the above grades and the yield was 3 , 40-4.73 t / ha.
3. In the composition of dried products (melons) with an artificial method of drying, the content of dry matter (0.5-1.1%), sugars (0.6-2.8%), and vitamin "C" was higher in comparison with the solar method; 2.40-4.60 mg /%) and these indicators, respectively, amounted to 80.6-86.7%, 60.7-71.4% and 15.4-56.0 mg /%, while the assessment was An advantage in the quality of dried products (melons) was noted in the artificial drying method compared to the solar method, it was of high quality and environmental cleanliness, and was rated 0.5-1.1 points higher.

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