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Evaluation Criteria of Organoleptic Properties of Dried Apple Fruit

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Abstract: This article describes the results of research on the dryinging of various varieties of apples. The experiments were conducted to study the parameters important for evaluating the organoleptic properties of apple fruit after drying. As a result of the research, scientifically based conclusions were made.

Keywords: apple, temperature, regime, dry matter, sensory evaluation, drying method, quality.

Introduction

Dried products are important in the food diet of people all over the world, and they occupy one of the leading positions as exports. In terms of importing dried fruits and vegetables in the world, China - 1479.3 thousand tons (16.9% of world import), India - 899.6 thousand tons (10.3%), USA - 445.0 thousand tons (5.1%), Japan - 355.8 thousand tons (4.1%), Pakistan - 335.8 thousand tons (3.8%), Great Britain - 222.7 thousand tons (2.6%) and Germany - 207.0 thousand tons (2.4%) are leading these days. In order to provide the population with quality products throughout the year, drying of fruits is one of the most important areas.

The apples are the most grown fruit in the world. It has more than 7,500 species. According to scientific data, the original homeland of apple is Central Asia, and there are about seven thousand species in the world. More than a hundred varieties of apples are grown in Uzbekistan. Also, Uzbekistan is ranked among the 15 countries in terms of apple production.

Material and methods

Research was conducted on the following apple varieties: "Golden Delishes", "Golden Graymz", "Kamola", "Parmen zimniy zolotoy", "Pervenets Samarkanda", "Renet Simerenko", "Rosmarin bely", "Sokh malikasi".

The following were studied for the selected varieties: Establishing the pre-treatment method before drying apples; Determining the most suitable for drying by varieties; Analysis of the importance level of indicators representing the organoleptic properties of dried apples.

According to the method of conducting research:

1. Analysis of the organoleptic properties of dried apples without peeling, divided into parts.
2. Analysis of organoleptic properties when dried apple varieties with peeled and pulled seeds.

Table 1. Scale of organoleptic properties for sensory analysis of dried apples

№	Quality indicators of apple	The coefficient of importance	Grade	Evaluation description
1.	Appearance	3,0	5	The pieces are whole
			4	The pieces are whole, but there are also a small number of broken pieces
			3	Lots of broken pieces

			2	Crushed
2.	Color	3,0	5	Yellow, bright
			4	Pale yellow, dense
			3	Green and pale yellow
			2	Brown and mixed
3.	Taste	6,0	5	Very sweet, pleasant taste
			4	Sweet
			3	Less sweet
			2	Not sweet, unpleasant taste
4.	Aroma	4,0	5	Pleasant, bright, apple-like
			4	Pleasant
			3	Less noticeable
			2	Not noticeable, unpleasant smell
5.	The consistency of the flesh	4,0	5	Dry, elastic
			4	Dry, low elasticity
			3	Dry, not elastic, but sticky when compressed
			2	Hard and stuck together

The study of the organoleptic properties of the fruits of the researched apple varieties was carried out based on the following indicators: 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 evaluation of dried products.

In order to ensure the differences in point scales, we developed the indicators that allow to clear the level of evaluation rate based on fruit properties. 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. It was taken into account here that the importance of each indicator differed from the other. For example, if the taste is the highest coefficient - 6 for dried apples, the appearance is equal to 3 coefficients. We can say that, the taste of the product is twice as much as it's appearance.

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

Results and discussion

Experiments were carried out on artificially dried fruits in a drying cabinet. Experiments were conducted at different temperatures. The optimal temperature for drying apple is 65-70°C, and the process lasted 6-8 hours.

In this way, we generated a 100-point scale to determine the quality indicators of apple fruit belonging to the experimented varieties by organoleptic method. In this case, an evaluation of the level of quality based on the coefficient of importance is provided (See Table 1).

The data obtained from the organoleptic analysis were summarized and presented in Table 2.

In this experiment, the standard deviation for each indicator did not exceed 0.5 and ranged from 0.0 to 0.45. Therefore, the overall ratings were the same. The organoleptic value of the dried product with the skin removed and the seeds removed was higher than the product cut and dried without peeling the skin. This result was the same in all varieties.

Table 2. Organoleptic properties of apple fruit when dried in different ways (2020-2021 years)

Drying method	Indicators					Overall grade, point
	Appearance	Color	Consistency	Taste	Aroma	
	Significance coefficient					
	3	3	4	6	4	
"Golden Delishes"						
I	4,71±0,45	4,57±0,49	4,71 ±0,45	5,00±0,00	5,00±0,00	96,71
II	4,29±0,45	4,29±0,45	4,29±0,45	4,57±0,49	4,57±0,49	88,57
"Golden Graymz"						
I	4,43±0,49	4,43±0,49	4,86±0,35	4,86±0,35	4,86±0,35	94,57
II	4,14±0,35	4,14±0,35	4,43±0,49	4,43±0,49	4,29±0,45	86,29
"Kamola"						
I	4,29±0,45	4,43±0,49	4,29±0,45	4,14±0,35	4,14±0,35	84,71
II	4,00±0,00	4,00±0,00	4,00±0,00	3,71±0,45	3,71 ±0,45	77,14
"Parmen zimniy zolotoy"						
I	4,29±0,45	4,14±0,35	4,14±0,35	4,57±0,49	4,57±0,49	87,57
II	4,14±0,35	4,14±0,35	4,00±0,00	4,00±0,00	3,86±0,35	80,29
"Pervenets Samarkanda"						
I	4,14±0,35	4,29±0,45	4,29±0,45	4,43±0,49	4,57±0,49	87,29
II	4,00±0,00	4,14±0,35	4,00±0,00	4,00±0,00	4,00±0,00	80,43
"Renet Simerenko"						
I	4,29±0,45	4,14±0,35	4,14±0,35	4,57±0,49	4,57±0,49	87,57
II	4,14±0,35	4,14±0,35	4,00±0,00	4,00±0,00	3,86±0,35	80,29
"Rosmarin bely"						
I	4,14±0,35	4,57±0,49	4,57±0,49	4,57±0,49	4,7,1±0,45	90,71
II	4,00±0,00	4,00±0,00	4,14±0,35	4,14±0,35	4,29±0,45	82,57
"Sokh malikasi"						
I	3,86±0,35	3,86±0,35	3,57±0,49	3,43±0,49	3,71±0,45	72,86
II	3,00±0,00	2,50±0,00	2,00±0,00	2,00±0,00	2,00±0,00	44,50

*I - Peeled and seeded

II – Unpeeled

When the quality of dried apple fruit was analyzed organoleptically, the quality indicators differed among the varieties. Among the dried products with peel and seeds removed, the highest index was recorded in "Golden Delishes", "Golden Graymz" and "Rosmarin bely" varieties, which were 97.71, 94.57 and 90.71 point, respectively, when evaluated on a 100-point system. The lowest indicator was observed in the "Sokh malikasi" variety, which was 72.86 point. Also, it was 84.71 point in "Kamola" variety, while it was in the range of 85-87 point in other varieties. The taste and aroma indicators were rated the highest among the indicators studied in all varieties. In particular, the maximum point was recorded in the "Golden Delishes" variety.

"Golden Delishes" and "Golden Graymz" varieties have the highest point among the products dried without peeling, and were 88.57 and 94.57 point, respectively. The lowest indicator was observed in the variety "Sokh malikasi" and was 44.50 point. It should be noted that this indicator indicates that the product is unusable for consumption. This indicator was 77.14 point in "Kamola" variety, while it was around 80 point in other varieties.

Conclusion

The taste and aroma indicators were the highest among the studied indicators in all varieties. Differences in indicators in the section of varieties showed that not all varieties are suitable for drying.

As a result of the organoleptic evaluation of dried apple, concluded as follows:

- Drying the apple with the skin removed and the seeds removed ensures that its organoleptic properties are high.
- Among the varieties selected for research, "Golden Delishes", "Golden Graymz" and "Rosmarinus bely" are the most suitable for drying.
- "Sokh malikasi" apple variety is not suitable for drying, and it is recommended to eat it mostly fresh.

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