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SUITABILITY OF DIFFERENT VARIETIES OF CARROT ROOTS (DAUCUS CAROTA L.) FOR PROCESSING

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ANNOTATION

The results of studying the efficiency of the production of dry products of carrots grown in the conditions of the desert soil-climatic zone of the Surkhandarya region, depending on the variety, are presented. A comprehensive assessment of fresh and dried carrot products of 22 different varieties was carried out in terms of the content of the main economic biological indicators in order to select the most suitable for drying. Varieties have been identified, the root crops of which are characterized by high yields, have the highest marketability, accumulate more dry matter, sugars, and the like.

Keywords: processing, drying, variety, carrot, root crop, productivity, quality, economic efficiency.

INTRODUCTION

The soil and climatic conditions of Uzbekistan allow growing almost all types of agricultural crops. 90% of all production falls on the non-state sector and more than 160,000 farms operate in the country, with about 6 million hectares of land assigned to them.

Over the past 10 years, the volume of processing fruits and vegetables and grapes has grown 3.5 times, including the volume of production of canned fruits and vegetables increased 2.5 times, dried fruits 4 times, natural juices 7 times. The share of processing exceeds 20% of the total production of fruits and vegetables.

In recent years, Uzbekistan has become a major exporter of more than 150 types of fresh and processed fruits and vegetables. The export potential is estimated at more than $5 billion [1]

In 2021, 21 million tons of fruits and vegetables were grown in Uzbekistan, of which about 2.3 million tons are carrots. About 90% of them are produced by farms or on household plots of dekhkan farms. This makes it difficult or completely eliminates the formation of large batches of uniform quality for export [2].

In addition, Uzbekistan is characterized by an uneven supply of vegetable products throughout the year. Their greatest number (more than 75%) comes during the summer-autumn period.

A prerequisite for reducing the volume of losses of fruit and vegetable products is the availability of a modern storage infrastructure and the introduction of harvesting and storage

standards. However, one of the important problems that directly affect the system of procurement, marketing and export of fruits and vegetables is the lack of modern vegetable and fruit storage facilities. Many growers sell their crops in the fall. Farmers and dekhkans keep only as much vegetables and fruits as they can save until December. Small wholesalers can store large quantities of vegetables until a maximum of January-February. Up to 30% of grown vegetables (potatoes, onions, carrots, cabbage, beets) do not reach the consumer due to the lack of specialized storage facilities [2]. Therefore, the study of alternative ways of storing vegetable products, including carrots, is timely.

The actual direction of vegetable processing in the world and in Uzbekistan is drying. Dried vegetables are becoming more and more popular. The advantage of dried products compared to fresh products is the possibility of their long-term storage (up to two years). Thanks to the use of modern drying technologies, the finished dried product retains up to 80-90% of vitamins and biologically active elements. Dried products do not contain any preservatives or chemicals and are not exposed to harmful rays. For packaging, storage and transportation of dried vegetables, containers, areas of storage facilities and vehicles are 4-10 times less compared to fresh products from which they are made [3].

Dried vegetables are a concentrate of nutrients, since during drying, free and some of the bound moisture is removed. Therefore, it is proposed to use the addition of dried vegetable crops with improved organoleptic properties, quality indicators and increased biological value in traditional food products as one of the ways to obtain functional products with desired properties.

Our country exports dried fruits and vegetables to the EU countries, China and CIS countries. It is worth noting that the market for dried fruits and nuts in Europe is 11 billion euros, dried vegetables - more than 8 billion euros.

FORMULATION OF THE PROBLEM

To get really high-quality dry products, many factors must be taken into account. In many countries where vegetables are dried professionally, for example, in the USA, the selection of varieties, growing technology, and harvesting are strictly controlled by manufacturers.

Carrots are one of the most common vegetable crops used for drying. Its dry products are an indispensable component of seasonings for making first courses, side dishes, ketchups, various seasonings, sauces, etc.; is a part of almost all dry vegetable mixes in the form of a powder - it is used as a natural dye. It gives ready-made dishes a pleasant color and taste, and most importantly, enriches them with biologically valuable and nutritious substances, mineral elements [3].

However, for the manufacture of really high-quality products that will meet the requirements of current regulatory documents, some features should be taken into account. An important factor among others is the choice of variety.

PURPOSE AND OBJECTIVES OF RESEARCH

For the production of high-quality dried products, fresh carrot roots must meet certain requirements, namely: contain a high amount of dry matter, sugars, and carotene. In addition, they should be distinguished by high taste, aromatic qualities, color uniformity, the absence of

a sharp transition from the core to the bark, as well as greening, which causes bitterness. To ensure a high yield of high-quality finished products, root crops have to form a small amount of waste in the process of preparation for drying. Therefore, one of the objectives of our research was to evaluate fresh carrot roots of various varieties in terms of the content of the main biochemical indicators, conduct a tasting, determine technological indicators (amount of waste and dry product yield) and calculate the drying efficiency of various varieties of carrots in order to identify the most suitable for production.

MATERIALS AND METHODS OF RESEARCH

The studies were carried out in 2019-2021. at the Termez Institute of Agrotechnologies and Innovative Development, including field - at the experimental site of the Surkhandarya Scientific Experimental Station of the Research Institute of Vegetables, Melons and Potatoes, located in the southern part of the Surkhandarya region.

In our studies, the laying of experiments, records and observations were carried out according to the methodological guidelines [4, 5].

For research, 22 varieties of table carrots were taken: 13 of them were domestic breeding (Farovon, Mshak 195, Mirzoi red 228, Nurli 70, Mirzoi mshak, Cylindrical red, Cylindrical yellow, Zarcha red, Zarcha yellow, Ziynatli, Baraka, Mshaki surkh, Mirzoi yellow 304) and 9 grades VNIISSOK (Russia) (Nadezhda F1, Minor, Marlinka, Margosha (Minsk), Moscow winter A-515, Nantskaya 4, Shantane 2461, Mars F1, Imperator)

The seeds were sown manually on August 10, 2019. The experiment was carried out without repetition. The area of the accounting plot is 2.8 sq.m. Arrangement of plots in two tiers.

The quality of root crops according to the main biochemical indicators and directly drying was determined in the scientific and educational laboratory of the Department of Storage Technology, Processing of Agricultural Products. Physical, organoleptic and biochemical parameters were determined according to generally accepted methods [6].

RESULTS AND ITS DISCUSSION

It has been established that the assortment of carrots differs significantly in terms of the main economic and biological indicators and nutritional value (Table 1).

Domestic varieties Mshak 195, Nurli 70, Mirzoi yellow 304, Cylindrical yellow, Mirzoi red 228, Zarcha red, Mirzoi mshak distinguished themselves by high productivity. Their yield increase was 8.6-30.2 t/ha more compared to the standard. The highest marketability was recorded in the Emperor and Mars varieties.

According to the literature data and our experiments, the most important factors determining the yield and quality of dry products are the content of the main biochemical parameters, especially dry matter (DM) and sugars in the feedstock (see Table 1).

Table 1.

Economic and biological indicators and nutritional value of fresh carrot roots of various varieties, for summer crops 2019-2021

Variety	yield		Weight of goods root-fruit, gr.	Marketability,%	Content in root crops		Output of dried products, %
	t/ga	± %			sum of sugars, %	**Dry matter %**	
Farowon (standard)	62,3	100	119,6	79,3	9,2	9,26	12,8
Mshak 195	92,5	148,4	154,9	68,1	9,4	8,2	11,5
Mirzoi red 228	75,6	123,1	167,1	66,9	10,7	11,4	12,6
Nurli 70	84,6	135,8	129,3	73,9	10,7	9,1	13,3
Mirzoi Mshak	70,9	113,8	156,0	73,4	12,1	12,0	13,7
Cylindrical red	60,5	97,1	151,3	76,2	8,6	12,0	11,7
Cylindrical yellow	78,6	126,1	165,0	75,6	11,2	10,0	13,3
Zarcha red	72,2	115,9	119,0	73,5	10,1	11,6	14,9
Zarcha yellow	55,5	89,0	118,4	68,5	10,1	10,2	13,4
Ziynatli	59,7	95,8	177,3	71,2	11,6	12,3	14,2
baraka	51,4	82,5	127,2	76,3	9,9	14,9	13,2
Mshaki surkh	42,7	68,5	161,5	66,4	10,1	14,9	12,6
Hope F1	58,7	94,2	86,6	60,0	13,1	13,8	16,6
Minor	58,8	94,3	86,7	77,2	11,8	17,2	14,8
Marlinka	51,2	82,1	126,0	76,6	11,4	16,8	15,8
Margosha (Minsk citizen)	39,6	63,5	114,7	62,3	11,1	12,5	13,3
Moscow winter	35,9	57,6	119,0	58,4	13,5	15,2	14,8
A-515	33,6	53,9	110,0	42,3	12,8	10,3	14,6
Nantes 4	60,0	96,3	162	76,4	12,7	12,8	13,9
Мирзои желтая 304	83,1	133,3	190,1	69,3	9,6	10,7	13,5
Марс F_1	27,5	44,1	112,5	81,4	12,5	16,0	15,8
Император	52,3	83,9	126,2	81,7	12,0	12,4	12,9

In the studied root crops, a rather high amount of dry matter accumulated - 8.2-17.2%. Its high content was found in the root crops of Minor, Marlinka, Mars F1, Moskovskaya Zimnyaya A-515, Mshaki Surkh varieties, the lowest content was found in varieties Mshak 195 and Nurli 70. Nadezhda F1 and Moskovskaya Zimnyaya A-515 varieties stood out in terms of total sugar content, which 4.3% more than the standard, and least of all it was in Cylindrical red - 8.6% (0.6% less than the standard).

The yield and yield of dried products have the greatest impact on the profitability of the production of dried products. The largest amount of finished products per 1 ha can be obtained by growing varieties Nadezhda F1, Marlinka and Mars F1 - 16.6%, which is 3.8% higher than the standard variant. The yield of dried products depended primarily on the dry matter content and yield. High-yielding varieties, the roots of which accumulated a sufficient amount of DM and were distinguished by a high yield of finished products, were the most profitable.

According to research results, the production of dried carrots of all varieties is profitable. The highest net income and profitability level was established in the production of dried carrot varieties Nadezhda F1, Marlinka, Mars F1, respectively, by 3.0 and 3.8% more compared to the control. It is least profitable to produce dried carrots using the varieties Zarcha red, Minor, Moscow winter A-515, Nantes 4.

CONCLUSIONS

Thus, according to a set of economic biological indicators, namely: yield, content of the main biochemical components, organoleptic indicators, the varieties Nadezhda F1, Marlinka and Mars F1 turned out to be the most suitable for drying. To increase this indicator, it is necessary to select varieties that are characterized by high yields and accumulate a sufficient amount of dry matter.

REFERENCES

1. Statistical data of the Ministry of Agriculture of the Republic of Uzbekistan.http://agro.uz/ru/information/about_agriculture/
2. Increasing the production and export potential of the fruit and vegetable industry in Uzbekistan: problems and prospects. Analytical report. Center for Economic Research, 2016
3. Kuts, AI, Prospects for processing and storage of agricultural products. / A.I. Kuts // Economics of the AIC, 2004. - No. 6. - P. 9-11.
4. Methodology of state variety testing of agricultural crops. Issue 4. Potato, vegetable and gourd culture. - M.: Kolos, 1975. -S. 5-25; pp. 116-135.
5. Litvinov S.S., Methods of field experiment in vegetable growing. - M.: VNIIO, 2011. -648 p.
6. Skaletskaya, L.F. Research methods of plant-growing raw materials. Laboratory workshop: Proc. allowance. / L.F. Skaletskaya, I. Podpryatov, A.V. Zavadskaya. - M .: Center for Information Technologies, 2009. - 153 p.