

Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th July, 2023

ISSN: 2835-396X

Website: econferenceseries.com

STUDY OF THE INFLUENCE OF THE MAIN INDICATORS OF RASPBERRY ON THE VACUUM SUBLIMATION DRYING PROCESS

Egamberdiev Azizbek Akramjon ogli,

Ergashev Oybek Karimovich,

Meliboev Mirazam Foziljon ogli

Namangan Institute of Engineering and Technology

Tel: +99 (893) 496 2813, e-mail: egamberdiyevazizbek206@gmail.com

Abstract

This article focuses on the current state of modern drying methods and the practical importance of organizing drying in industry, as well as analytical data on the theoretical basis of drying, the main properties of raspberries and their dependence on drying. Recommendations on the selection criteria of raw materials for drying have also been given.

Keywords: raspberry, property, indicator, drying technology, chemical composition, mineral substances, dependence on drying.

Introduction

Drying is one of the common folk methods of canning. It is considered a complex mass exchange process and is one of the processing methods that allows effective preservation of products made from plant raw materials [1]. The main thing in drying products is to preserve their properties and increase their quality. Sublimation drying is the only viable method for obtaining dry form for most thermolabile biological materials. The reason is that in this case, the quality of the product is maximum, regeneration is easy when moistening it, and the original properties of the dried product, such as smell, taste, color, nutritional and biological value, are preserved. In the process of sublimation drying, the moisture in the material is in the form of ice, and then this ice turns directly into vapor, instead of turning into a liquid state. Today, improving the sublimation drying process of not only fruits and vegetables, but also berries, including raspberries, is becoming one of the urgent issues [2].

THEORETICAL BASIS

Raspberries have high taste, medicinal and healing properties, and the fruit is mainly eaten fresh. Due to the presence of salicylic acid in dried raspberries, it is used as a



Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th July, 2023

ISSN: 2835-396X

Website: econferenceseries.com

treatment for colds. The energy value of 100 grams of dried raspberries is 241 kcal. If raspberry is dried at a temperature of 30÷50⁰ C, its beneficial properties and nutrients are preserved [6].

Its composition consists of 85% water, and it contains the following vitamins and minerals [7]:

Table 1

№	Vitamins	Minerals
1	C - 44 %	Manganese - 34 %
2	K - 10 %	Magnesium - 5 %
3	B9 - 5 %	Iron - 4 %
4	E - 4 %	Copper - 4 %
5	B6 - 3 %	Zinc - 3 %

ANALYSIS AND RESULTS. In order to achieve an effective result in the process of sublimation drying of raspberries, the work was carried out in the following order:

The first stage is the preparation of raw materials for drying. It is recommended to choose a freshly selected product for sublimation drying of raspberries. After 24 hours, raspberries may have lost their vitamins, darken or have a sour taste. Before putting the product in the refrigerator, it is necessary to check the fruits and remove all crushed products.

The second stage - the raspberry selected as a research object was placed on drying lists and placed in a laboratory freezer called Arctico and frozen to a temperature of -40⁰ C. The process depends on the ambient temperature and lasts up to 8 hours. The higher the ambient temperature is above 25⁰ C, the lower the freezing rate.



1.1 – picture. Raw material

1.2 – picture. Frozen product



Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th July, 2023

ISSN: 2835-396X

Website: econferenceseries.com

The third stage - after the product has been frozen to the specified temperature, it is removed from the freezing chamber and placed in the drying chamber, and the temperature inside the chamber is brought to -10°C . To bring the temperature inside the chamber to negative level, the freeze knob on the electrical panel was turned and the indicator reading was set to 10 and the temperature was raised according to the table below.

Table 2

№	Time (hour)	Temperature indicator ($^{\circ}\text{C}$)	Vacuum (MPa)
1	2	-10	0.1
2	2	-5	0.1
3	4	0	0.1

CONCLUSION

Based on the results of the research, it can be concluded that by freezing the product in these parameters, it is possible to preserve its useful properties. Also, during the experiment, it was confirmed that the use of the sublimation method for drying raspberries has the following advantages:

- keeping raspberry color, appearance and even aroma;
- possibility of long storage;
- production is environmentally friendly, no chemicals are used.

Used literatures

1. M.F. Meliboev. Use of highly efficient combined methods in drying plums. Dissertation of the Doctor of Philosophy in Technical Sciences, - Tashkent: TKTI, 2022, 104 p.
2. T.L. Khudaiberdiev. Technology and equipment for drying agricultural products, textbook. - Tashkent: "Mukhr press" publishing house, 2022, - 232 p.
3. Z. Salimov. The main processes and devices of chemical technology.: Textbook for students of higher educational institution. T.1. - T: Uzbekistan, 1994. – 366 p.
4. Z. Salimov. Basic processes and devices of chemical technology, T.2. Metabolic processes: a textbook for higher educational institutions. - T: Uzbekistan, 1995. – 238 p.
5. N.R. Yusupbekov, H.S. Nurmuhamedov, S.G. Zakirov. Chemical technology



Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th July, 2023

ISSN: 2835-396X

Website: econferenceseries.com

basic processes and devices. - T.: "Science and technology", 2015, 848 p.

Electronic resource:

6. <https://uz.battagliadifiori.com/10151-sublimirovannaja-malina-4716>
7. <https://uz.cosmeticn.ru/11223-raspberry-composition-useful-properties-and-harm.html>



E- Conference Series

Open Access | Peer Reviewed | Conference Proceedings



E- CONFERENCE
SERIES