

RESEARCH OF DRIED DATES PRODUCTION TECHNOLOGY

Xojiev Adxam

Doctoral Student of the Namangan Academy of Engineering and Technology.

Choriev Abdusattar

Associate Professor, Tashkent State Technical University

Annotation

Date varieties were studied and selected for drying. Dates are dried in a combinatorial way. The change in the moisture content of dates in time has been studied.

Keywords: palm tree, drying, equipment, humidity, time, temperature, drying cabinet, energy.

Introduction

Date (*Diospyros*) is a subtropical tree or shrub belonging to the date palm family, a planted fruit tree. About 500 species are found in tropical and subtropical regions. It is grown in China, Japan, Mediterranean countries, Australia, USA, the Caucasus and Central Asia. On fruit, mainly oriental X., frost-resistant virgin X.si. (*Diospyros virginiana*), as well as Caucasian X.si (*Diospyros lotus*). *Diospyros kaki* Tpip. Originally from Uzbekistan, originally from China. A tree 8-12 m high, beautiful, round or pyramidal in shape, lives 100-400 years, sometimes longer, but bears fruit well for 50-60 years. The leaves are large, ovate, dark green above, pubescent on the reverse side, linear, reddish before falling off. The flowers are unisexual, sometimes bisexual, bloom in April and ripen in October-November. Fruits in various forms (up to 500 g). X. contains sugar, vitamin C, protein, iron salts, protein, supplements, etc. The fruits are stored for 2-3 months, eaten fresh and dried, used in confectionery, liqueurs, wines and jams. Dates are mainly propagated by grafting. Seedlings are planted in autumn or spring according to the schemes 8x6 and 6x6 m. Does not like sandy, gravel-salty soils. It begins to bear fruit at 3-4 years, and at the age of 10-12 years it begins to bear fruit fully. One bush can give up to 250 kg. Watered 10-12 times during the growing season, depending on the condition of the soil; fertilized, the environment softens. There are main varieties of dates that are common in Uzbekistan and the Surkhandarya region, as well as adapted for the Navoi, Namangan and Samarkand regions (Vakhsh, Xiakum, Zenjimar, Tajikistan, etc.).

For drying, ripe fruits with a dense structure are selected. Light-colored, fleshy dates were used because dark, fleshy dates are unsightly, resulting in dried fruits that range in color from dark brown to black. In dried fruits, the sharpness of the date is lost, and dried fruits of astringent, but sugary varieties have a good taste.

Dried dates contain 51-70% sugar and 0.3-0.85% organic acids, depending on navigation. Dried dates contain very little vitamin C.

Cooked dates are blanched for 15-20 seconds. Dates were placed on baking sheets and dried in an oven at 60°C. Drying time - 3-6 hours. Dried dates with a moisture content of 35% can be stored for a long time, if there is not enough moisture, the fruits will be tougher and less tasty.

It is known that the creation and development of small production lines in the food industry will satisfy the demand for dried fruits and vegetables. One way to meet the demand for dried fruits and vegetables is to intensify the drying of dates, the main technological process is environmentally friendly and energy efficient.

In addition, food safety is important in the process of drying dates, both in large drying plants and in small farms that carry out a natural drying process. Due to the periodicity of the process on technological lines with natural drying, it is especially important to obtain dried dates with the same commercial quality indicators [1].

Initially, we took dates in the laboratory and dried them in an oven. Dried fruits are cut crosswise with a knife to a thickness of 0.5-0.6 cm and a length of 0.7-1 cm. The cut pieces are first treated with water vapor. Because we need to keep the softness of the dried product and improve the appearance of the product. After steaming for 5-7 minutes, allow to dry.

The cut pieces are collected on the surface of the drying tray and poured to dry at a temperature of 65 °C. Temperature matters when drying. When drying in natural home conditions, the top layer is first cut off and dried for 15-30 days.

We can reduce the drying time of a product by 2-3 times by exposing it to infrared rays along with the temperature during drying. The drying cabinet must be protected from the external environment, equipped with an infrared lamp and equipped with special ventilation devices for air circulation (fig. 1 and 2).



Figure 1. Drying cabinet



Figure 2. Sliced dates for drying

During the experiment, we weigh the product every 30 min and return the results. Drying lasted for 3 hours. Divided into 5 samples for drying. Samples 1, 2 and 3 were cut crosswise, and samples 4 and 5 were cut longitudinally. In total, we will measure 7

times in the experiment. The first is to measure before drying (100 g). The next 6 measurements are the measurements after drying (Figure 3).

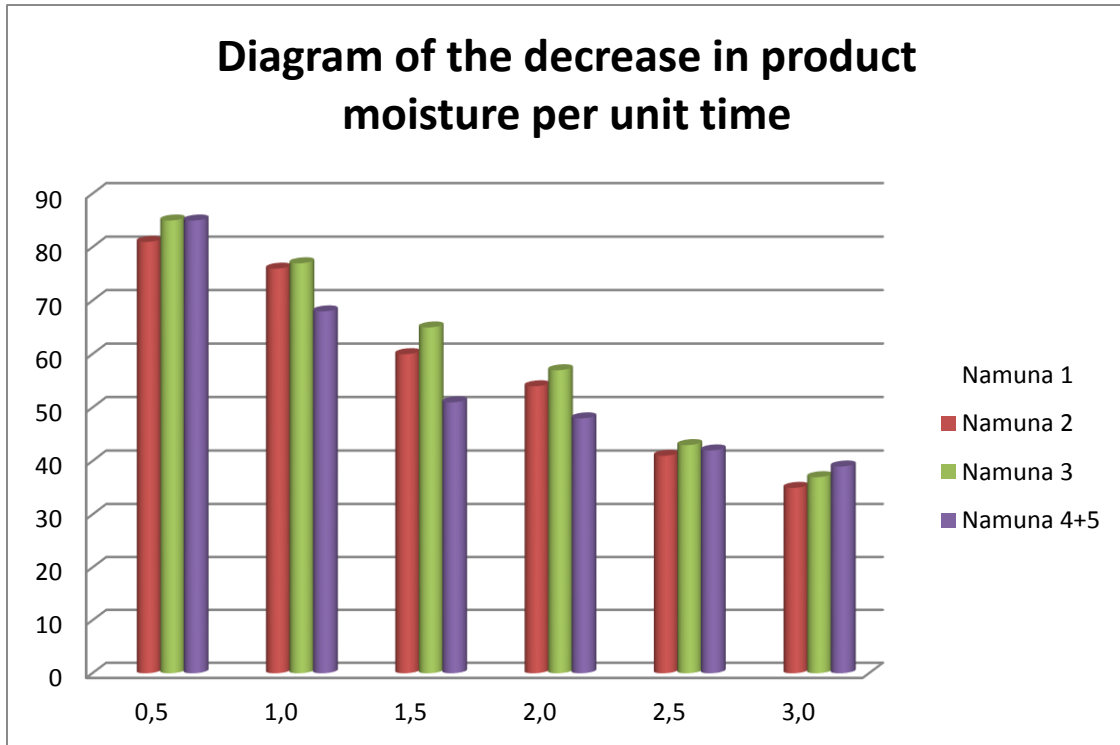


Figure 3. Moisture in dates changes over time.

The experiments were conducted on a production line consisting of high-quality energy-saving devices (Figure 4).

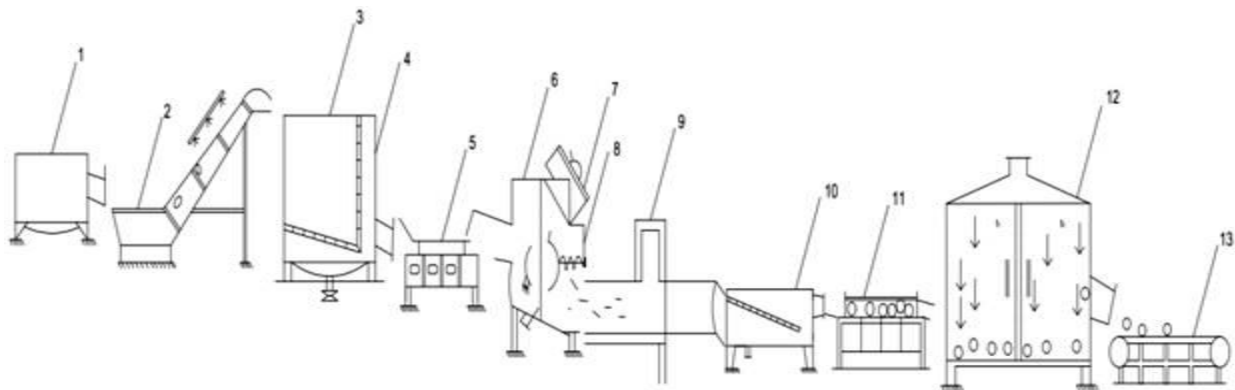


Figure 4. Technological scheme of combined drying of dates:

1 - washing machine; 2 - inspection conveyor; 3,4 - reservoir (surface); 5 - belt conveyor; 6,7,8 - peeling machine; 9 - viewing window; 10 - washing bath; 11,13 plate conveyor; 12 - dryer.

A technological line (scheme) has been developed for drying dates (Figure 4). The dryer (12) is an isothermal cabinet that consists of a rotating drum with a raised heat

conductor and a high exhaust air conditioner. The drum has a steel mesh pan and rotates at a speed of 1 turn. The temperature of the incoming air is 90 ° C. The flow rate is regulated by a thermocouple that maintains the temperature inside the cabinet at 80 ° C. The top air conditioner circulates the hot air inside the cabinet. Drying time 16 hours. Output capacity is 100 kg / h [4].

CONCLUSION

Date varieties were studied and selected for drying.

Dates are dried in a combinatorial manner.

The change in moisture content of dates over time has been studied.

Research has shown that, depending on the need, it is necessary to create a dryer, improve the existing ones and put them into production.

REFERENCES

1. Хохлов С.Ю., Мельников В.А., Цюпка С.Ю., Панюшкина Е.С. Перспективные направления переработки плодов хурмы (анализ патентной информации) / Синтез науки и общества в решении глобальных проблем современности: сборник статей Международной научно-практической конференции (18 января 2017 г., г. Уфа). В 3 ч. – Ч.3. – Уфа: МЦИИ ОМЕГА САЙНС, 2017. – С. 34-38.
2. Tuktaev Sh., Samadov O., Choriev A., Akramova R., Xolmurodov B. Research Pre-Treatment Technology and Ir Convective Drying of Pumpkin. // Texas Journal of Engineering and Technology. ISSN NO:2770-4491. 05-10-2021. –P.4-7.
3. Xolmurodox B, Xojiev A, Xolmurodox B, Choriev A. Xurmo kimyoviy tarkibini tadqiq etish. UZMU xabarlari, 2022, [3/1/1]. -422-424 b.
4. Тутельян, В.А. Рекомендуемые уровни потребления пищевых и биологически активных веществ / В.А. Тутельян.- М.: 2004.- 42 с.