Research Paper

EPRA International Journal of Economic and Business Review-Peer Reviewed Journal
Volume - 10, Issue - 4, April 2022 | e-ISSN: 2347 - 9671| p- ISSN: 2349 – 0187

SJIF Impact Factor: 8.302 || ISI Value: 1.433 || Journal DOI URL: https://doi.org/10.36713/epra2012

STORAGE OF VEGETABLE PRODUCTS ON FARMS DIRECTIONS FOR THE PROVISION OF SERVICES AND EFFECTIVE METHOD SELECTION CRITERIA

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ABSTRACT DOI No: 10.36713/epra9926 Article DOI: https://doi.org/10.36713/epra9926

Ensuring the food security of the country is a multifaceted problem, the solution of which requires a comprehensive approach. It is not enough to produce food raw materials alone, it is necessary to create and maintain logistics chains that are constantly operating efficiently to deliver the grown crop to consumers. The purpose of the study is to develop criteria for the selection of effective methods and directions for the establishment of services for the storage of vegetable products on farms. Research methods include experiment, analysis, modeling, logic, synthesis, induction, deduction, hypothetical, study and oboshchenie, abstragirovanie, idealization, formalization, analysis and synthesis, induction and deduction, axiomatics and others.

KEYWORDS: ***agro-industrial complex, foreign experience, vegetable products***

INTRODUCTION

Today, the issue of making full use of the opportunities for sustainable development of agricultural production is mainly the responsibility of the farmer. The expansion of economic freedom of farms and dehkan farms as entrepreneurs coincides with the liberalization of their activities as consumers and sellers in the market of resources and services.

However, the increase in the degree of economic freedom of the farmer also places the responsibility on the farmer for the outcome of production. That is, the farmer as an entrepreneur must look for opportunities to select effective agricultural machinery, spare parts, mineral fertilizers, quality seeds, seedlings of fruit trees, varieties that allow to grow products within market demand and implement appropriate agro-technical measures.

In addition to the above issues, the delivery of grown products to the consumer with a high level of added value has become a very important part of ensuring the economic efficiency of fruit and vegetable production and the process of reproduction. In particular, most of the fruits, vegetables and grapes grown are marketed directly at the time of ripening, rather than through a storage system or processing system in warehouses. This does not allow the product manufacturer to get a high level of profit.

necessary to develop service infrastructure in order to support the entrepreneur who is engaged in the development of the storage system and storage-related industries - the task of the state - to create value-added measures for farmers and dehkan farms through storage. solution of organizational, legal and financial issues.

Today, as a result of reforms in the development of services for agricultural production, the infrastructure of agricultural services is developing rapidly. At present, 1487 alternative machine and tractor parks, 1503 SIUs, 987 petroleum

products outlets, 952 mineral fertilizer outlets, 2616 veterinary service outlets, 299 consulting and marketing services for farms and dehkan farms are operating in the country as of 2019. are showing.

It should be noted that in the development of infrastructure serving agriculture, the importance of creating a market information system within the district departments of agriculture and water management for the sale of fruits, vegetables, melons, potatoes and grapes in the regions through the preparation, processing and storage. However, in order to develop such services, it is necessary to organize real protection of the rights of the entrepreneur as a private owner. It is also important to develop the infrastructure related to the storage of fruits and vegetables, eliminating the administrative approach to the organization of service facilities, based on real local demand and supply, as well as entrepreneurial initiatives.

Today, the growing globalization of the process of trade in agricultural food products in the world leads to the deepening of international specialization in the cultivation of fruits and vegetables in countries located in different parts of the planet. This, in turn, will allow managing measures to stabilize supply and demand in national markets at the state level through import operations. However, this is not a reliable and always self-justifying organizational-economic mechanism. This is due to a number of socio-economic factors:

- First, the "trade embargo" method, often used by developed countries and their various allies due to local social upheavals, economic and political crises, affects all countries in the global world, and the stability of the domestic food market depends on imports. existing states suffer the most economically and socially;

- Second, for countries such as Uzbekistan, which has a natural climate for the production of large quantities of fruits and vegetables, has many years of experience and scientific and intellectual potential, measures to stabilize the domestic market through export operations rather than import operations are economically justified;

- Third, the society using modern market mechanisms using the existing agricultural potential (land and water resources, natural factors, sufficient skilled labor, scientific potential, developing international economic relations and, finally, socio-economic stability in society associated with national traditions) The effective use within the interests is an objective necessity.

Therefore, the development of the storage system is very important to ensure that apples, onions, potatoes and grapes grown in the country enter the table of our people with fresh produce throughout the year.

MATERIALS AND METHODS

The purpose of the study is to develop criteria for the selection of effective methods and directions for the establishment of services for the storage of vegetable products on farms.

Research methods include experimentation, analysis, modeling, logic, synthesis, induction, deduction, hypothetical, study and idealization, formalization, analysis and synthesis, induction and deduction, axiomatic, etc. Including: the introduction of a system of leasing modern storage facilities (storage areas of a certain size) to farmers and farms can be justified. Introduce this experimentally by regularly looking for ways to reduce the cost of storing a product on the basis of various cost-saving technologies, determining the cost of a kilogram of product for a month or a day on the basis of accurate calculations; on the basis of calculations, it is necessary to introduce services for the timely storage of products through a regular search for ways to reduce the cost of storage of 1 kg of product for a month. In this case, the growing entity (farms and dehkan farms, state-owned or private horticulture, vegetable growing) applies to the storage company for the storage of their products for a certain period of time and the establishment of contract services. Transfer of ownership of the stored product to the custodian; at the same time, storage entities purchase fruits, vegetables, grapes, onions and potatoes from farms in the region for storage on the basis of pre-arranged contracts or on the basis of conditions during the ripening period. This requires prior knowledge of the sales channels of the stored product or cooperation with large buyers, supermarkets with long-term business relationships.

RESULTS AND DISCUSSION

High-yield technologies for vegetable crops and potatoes have been developed and are becoming more popular in practice as a secondary crop after the harvest of cereals on irrigated lands on farms.

This means that the development of horticulture, viticulture and vegetable growing around large settlements is becoming more and more important.

In areas where horticulture, vegetable growing and viticulture are well developed, it is necessary to organize regular training seminars through demonstrations of exemplary low-cost traditional technologies for storage of agricultural products, small-scale technologies for storing modern products. At the same time, the involvement of leading scientists in the industry and specialists with long-term experience in the storage of products in warehouses without compromising their quality gives a highly anticipated effect.

It is expedient to establish a system of services for the storage of products grown in nearby areas,

grown by large-scale warehouses in the fruit and vegetable areas. In this case (Figure 1):

- First of all, the establishment of a system of leasing to farmers and farms the storage facilities of modern warehouses (storage areas of a certain size) can be justified. This is based on accurate calculations of the cost per kilogram of product for a month or a day

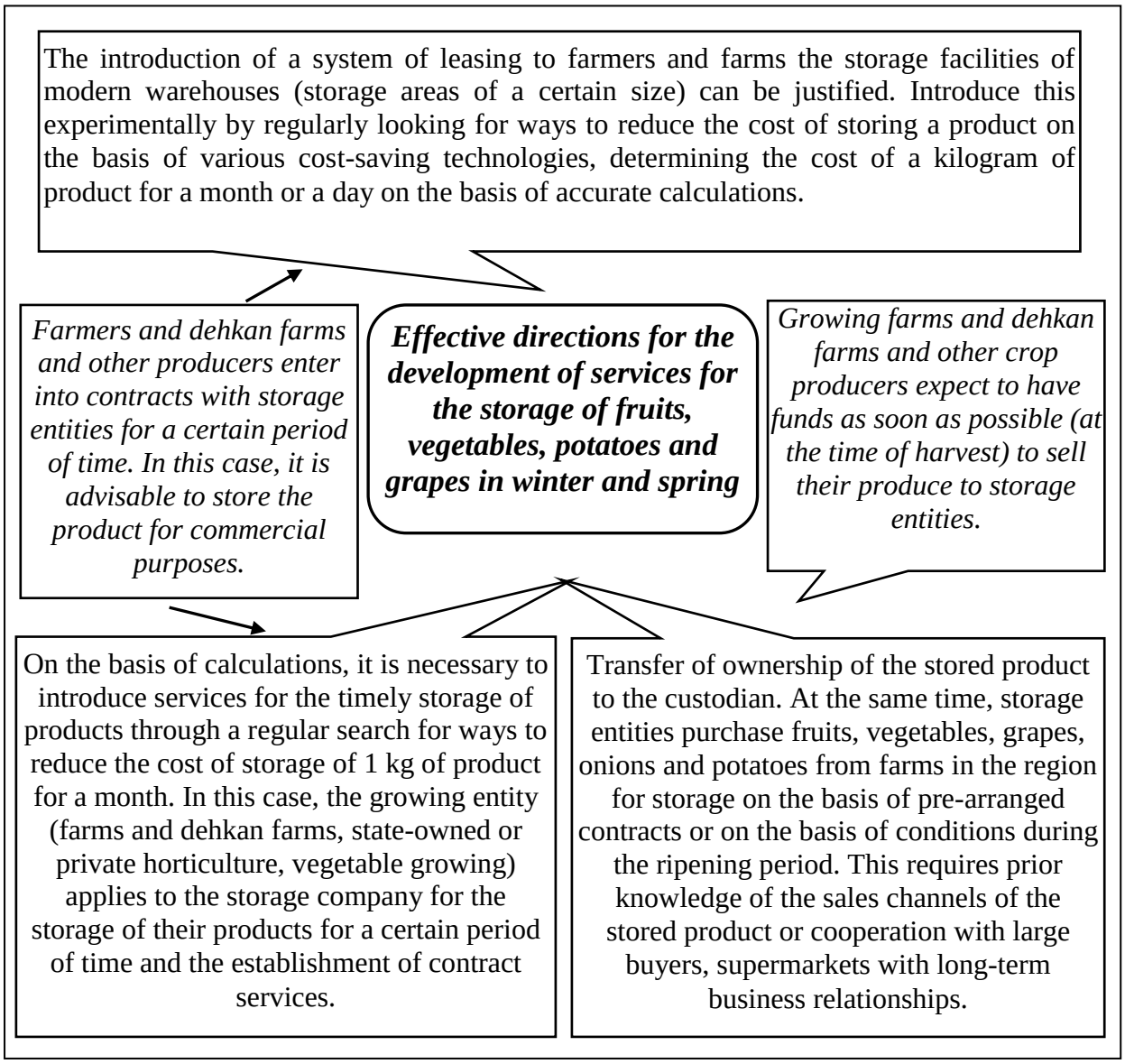


Figure 1.1. Product storage in fruit and vegetable areas directions for the establishment of services on[1]

[1] Source: Developed by the author.

should be introduced experimentally by regularly looking for ways to reduce the cost of storage of the product during storage;

- The second direction is the introduction of services for the temporary storage of products by regularly looking for ways to reduce the cost of storage of products, determining the cost of one kilogram of product for a month or a day on the basis of accurate calculations. In this case, the growing entity (farms and dehkan farms, state-owned or private horticulture, vegetable growing) applies to the storage company for the storage of their products for a certain period of time and provides services on a contractual basis.
- The third direction is the transfer of ownership of the product placed in storage to the storage entity. At the same time, storage entities purchase fruits and vegetables, grapes, onions and potatoes from farmers and dehkan farms in the region on the basis of pre-arranged contracts or for storage at the time of ripening. In this case, the fact that the sales channels of the products placed in storage are known in advance or working in cooperation with large buyers, supermarkets with long-term economic ties, gives the expected effect for storage entities.

A complex issue that applies to both of the above areas is the storage of products, which affects the natural and mechanical loss of the product during storage - quality, condition of mechanical damage, product varieties of fruits and vegetables, agro-technical measures used on farms during the growing season. is to determine compatibility. The listed issues allow to predict the amount of products placed in storage and the degree of natural stagnation at the end of the storage period. This issue should be clearly stated in the contract between the service provider and the service user, taking into account various force majeure circumstances.

We believe that a fair and mutually beneficial solution to the above-mentioned issues will play a crucial role in determining the development of the product storage system. Also, the need for infrastructure related to the development of storage services for vegetables grown in excess of regional consumption (the size of local markets) in remote areas of the country requires the development of other relevant areas. For example, while there must be a real and sustainable regional demand for storage services, the development of product storage networks requires first and foremost a regular electricity supply, water supply, a stable communication system and quality roads. This issue should be taken into account when building storage facilities for businesses.

In areas where the power supply is not in demand, increasing the scale of the introduction of mobile power sources, especially solar panels, is one of the most pressing social and economic issues.

Today, scientists are faced with the creation of new varieties of agricultural crops that can adapt to various environmental and environmental conditions, drought and drought tolerant, high yield, marketable product quality and appearance, disease resistant, export-oriented products that meet world market requirements. task is set. However, the issue of creating varieties suitable for storage for the winter and spring seasons, or the development of agro-technical measures adapted for storage of products, is neglected. This is because experts say that the metabolic activity of fruits is relatively high even during storage in accordance with the ratio of active substances in certain varieties. In particular, the Golden Delishes variety of apple loses the most weight among apples during storage, and as a result, fruit wilting is relatively high. The weight loss of this variety during the average storage period for different storage methods is up to 10%. Of this, 40% is due to the evaporation of moisture and 60% is due to the heat capacity and the weight of carbon dioxide released as a result of oxidation of organic matter in the fruit in the presence of oxygen.

This is a natural ripening process, a process in which the necessary energy needed for the life of living cells in the fruit is formed based on chemical reactions. Therefore, the optimal humidity regime in warehouses, relatively low freezing temperatures and limited oxygen in the storage of fruits are the basis of all methods of storage.

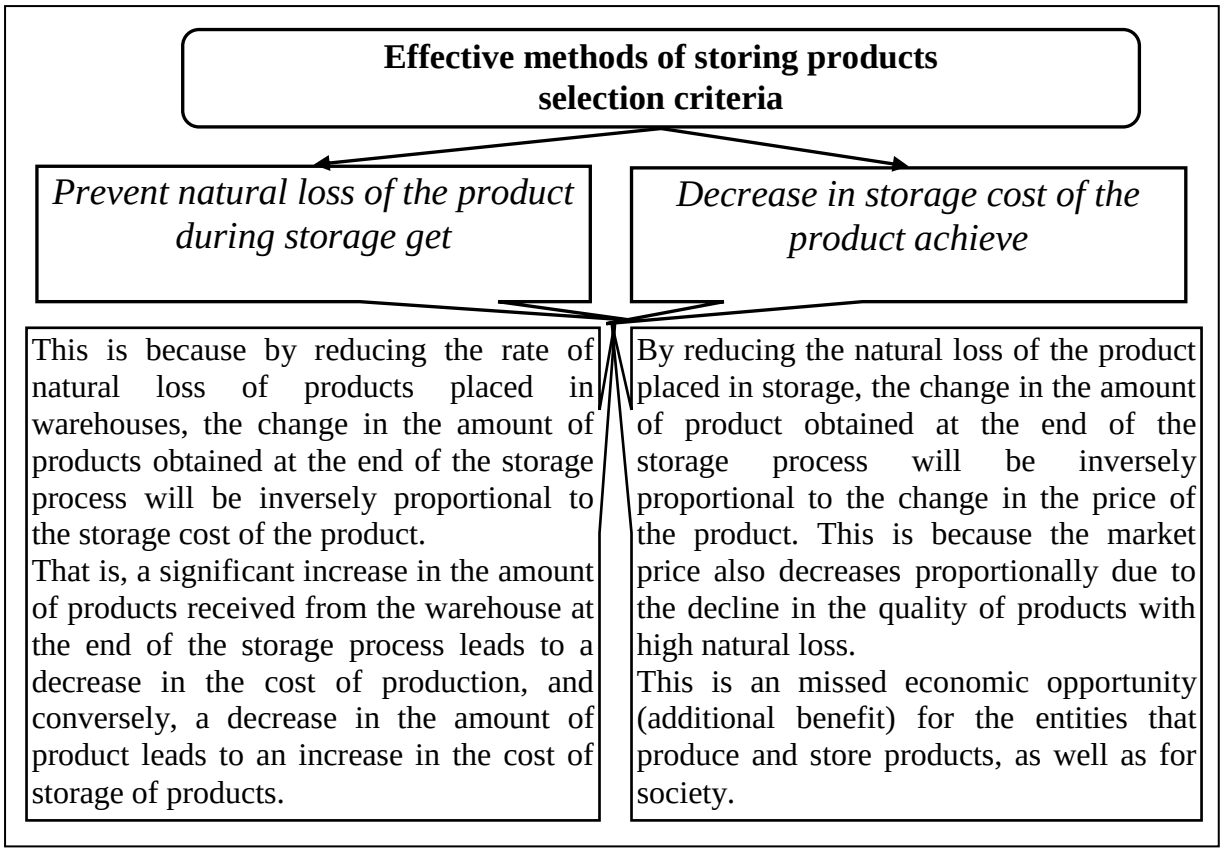
Scientists have also proven that the limit of temperature drop during storage varies according to the type of fruit and the variety within the species. For example, some apple varieties can be stored at temperatures down to -4 ° C, while most apple varieties become unusable at this temperature.

Temperature maintenance in modern warehouses requires the use of additional refrigeration equipment, installation of additional temperature storage devices, visual or automatic temperature control, keeping the temperature low when the days are hot, and vice versa in cold weather, overwork, electricity consumption, etc. associated with costs, leading to an increase in the cost of storing products.

The storage temperature recommended by field scientists is around -1.0 ° C to -2.0 ° C for most apple varieties. The average freezing temperature is -2 C ° for most apples and -3.8 C ° for grapes. Therefore, if different storage methods are recommended for different fruits, storage methods may be different for different regions of the country.

In our view, the selection of the most efficient methods of product storage should be based on the following two main criteria (Figure 2):

- "Prevention of natural loss of vegetable products during storage";



1 .2. Effective methods of storing products selection criteria[2]

- To achieve the goal of "achieving a reduction in the cost of storage of vegetable products."

If we analyze logically, the first goal serves to achieve the second goal. This is because by changing the rate of natural loss of products placed in warehouses, the change in the amount of products obtained at the end of the storage process will be inversely proportional to the storage cost of the product. That is, a relative increase in the amount of products received at the end of the storage process leads to a decrease in the cost of production, and conversely, a decrease in the amount of product leads to an increase in the cost of storage of products.

Based on the above considerations, it will also be possible to ignore the first goal in choosing product storage methods in warehouses. However, this is not true. Because the analysis shows that the natural loss of their weight in warehouses during the storage of grapes, apples, onions and potatoes is not only a quantitative loss of this product for growers. The natural loss of a product is a process associated with a physiological change in its fruit, i.e. a change in the taste, appearance and consequent quality of the product.

So, if the second logical conclusion is made under the first goal, reducing the rate of natural loss of vegetable products stored in warehouses will

In stored products, complex processes continue during storage, as in the growing period in the field, and the ripening of the product increases. These processes are biochemical (chemical changes in composition), physiological (respiration, formation of new tissue, maturation), physical (evaporation, withering, sweating, cooling and freezing, change in size and weight), microbiological and physiological processes, natural loss and various diseases occur.

Along with the decomposition of organic matter in products, during the synthesis (oxidation of sugar, starch, organic acids, oxygen) heat energy is released, and organic matter decomposes, reducing the amount of product. In particular, SO_2 released at 15 ° C is 2.5-3.3 times higher than at 0 ° C.

Hence, the duration of the storage period of products and the amount of temperature in the storage process for products also vary within certain product types and their varieties, which requires the selection of an important indicator in the selection of storage temperature. For example, as mentioned above, the average optimum storage temperature for different varieties of apples has been recommended. This temperature is the lowest temperature at which the product freezes during storage.

However, it is also noted by mathematicians that it can vary depending on the variety of apple. In conclusion, it is necessary to determine the lowest temperature at which fruits, grapes are stored. As the simplest method of determining this effective temperature limit, it is recommended to take into

[2] Source: Developed by the author.

account the weight of sugars in different forms in the composition of the fruit. This is because the weight of sugar in the fruit is inversely proportional to the water content of the fruit. Vegetables and fruits that are less juicy and juicy freeze relatively quickly. The importance of the issues raised is that effective temperature, with the final quality of the product placed in storage, is the strongest factor influencing the cost of storage and allows to determine the cost-effectiveness of storage methods.

CONCLUSION

It also saves labor costs relative to the amount of produce produced by the difference between the average market price at the time of production (mass seasonal ripening period) and the average market price at the time of sale through storage. In other words, the sale of more expensive products while preserving will result in a higher quantity in terms of the price of the product in the period of storage and a reduction in the cost of labor (live and materialized) spent on its cultivation. In other words, there is an opportunity to save the resources involved in production at the expense of the unit of production by reducing the loss of the amount of product grown (without the production of additional products). A more sophisticated modern technical base for the storage of agricultural products , the acquisition of new technological knowledge , The formation of qualified specialists in the field of health care reflects the expansion of significant economic potential for the country's economy. Part of the additional profits from storage will be directed to the development of production, improvement of the storage system, modernization of technological equipment related to quality control of potatoes, grapes and fruits and vegetables in warehouses.

relative humidity in the air and the respiration of vegetable products, as the high content of water and carbohydrates in the storage of vegetables in farms leads to a very high rate of natural loss through respiration (oxidation). Anaerobic in stored products with a decrease in oxygen in the air the onset of the respiratory process, which is also a factor leading to a decrease in product quality and weight loss. Therefore, the physiological characteristics of each stored agricultural product, physical parameters (thickness of the bark, susceptibility to mechanical damage), the focus of agro-technical measures on their storage, the effective organization of storage of organizational measures from harvest to storage (product volume) and prevention of quality degradation).

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