

CURRENT STATE, OBSTACLES AND OPPORTUNITIES FOR THE DEVELOPMENT OF THE CHAMPIGNON MUSHROOM PRODUCTION INDUSTRY IN THE REPUBLIC OF MOLDOVA

Viorel TUREȚCHI, Scientific Researcher,
National Institute for Economic Research, Moldova
turetchiv@gmail.com

DOI: <https://doi.org/10.36004/nier.cecg.II.2022.16.19>

The paper has been developed within the State Program "Development of new economic instruments for assessing and stimulating the competitiveness of agriculture of the Republic of Moldova for the years 2020 - 2023" (code - 20.80009.0807.16), financed from the state budget of the Republic of Moldova through the National Agency for Research and Development.

Summary

Due to their nutritional and economic value, champignon mushrooms are appreciated by both consumers and domestic agricultural entrepreneurs. The ability of this culture to provide up to five - six harvests during the year, the constant demand on the local market for the given product, reflects, at first sight, guaranteed economic successes for potential mushroom producers. However, the specifics of the local market, as well as the technical and material conditions available for carrying out the production process in the conditions of the Republic of Moldova, carry a series of risks that can seriously compromise the success of the given business.

The purpose of this work is to confirm the economic advantage of producing champignon mushrooms in the conditions of our country, to reflect the necessary technological measures to be implemented, the risks that may arise in the production process.

General research methods (empirical and theoretical methods) were used in the preparation of the report, the analysis of statistical data reflecting the dynamics of the foreign and local markets was widely applied.

The report presents both the analysis of the statistical data and the derived conclusions, and the effects are interpreted through the lens of promoting agricultural products with a high economic value.

The results of the report present the dynamics of the local mushroom production sector, development opportunities and measures to make the field more efficient.

Keywords: agriculture, mushrooms, technologies, production, efficiency

JEL: Q12, Q13, Q16.

UDC: 631.151:635.82] (478)

Introduction. The production of edible mushrooms of the Champignon species (*Agaricus bisporus*) or simply - champignon, represents an agricultural entrepreneurial activity with great economic prospects. It is a crop with a high food and economic value, and from a technological point of view it can be grown in

protected conditions, which greatly reduces the dependence on unfavorable climatic factors.

This species can be produced both in small spaces, in auxiliary households, and on an industrial scale, using underground limestone quarries, warehouses of agricultural enterprises, basements with extensive areas.

The exceptional food value, the wide area of use in the field of medicine imposes a constant demand for the respective product. With a marketing price accessible to most consumers, the varied way of use, mushrooms generate constant income for producers around the world.

In the Republic of Moldova, around two thousand tons of mushrooms are produced annually, most of the production being intended for fresh marketing. For the manufacturing industry, domestic production does not meet the technological requirements and domestic producers cannot guarantee the requested quantities. Regulation of the given situation can only be done by introducing modern production technologies, adapted to the conditions of the Republic of Moldova.

Material and method. The elaboration of the report was carried out on the basis of general research methods (empirical and theoretical methods), the analysis of statistical data reflecting the dynamics of production and commercialization of Champignon mushroom production in the Republic of Moldova was widely applied.

Primary documents represented by specialized literature (books, monographs, scientific reports and didactic materials, etc.), as well as secondary documents in the form of institutional sources (statistics by field) were used as sources for the research. Extensive use was made of the information provided by the National Bureau of Statistics.

Results and discussions. Being an accessible food product with valuable nutritional qualities, with the passage of time, people gradually tried to transform the development of mushrooms from a spontaneous culture to a culture obtained in a directed way. Thus, over time countless attempts were made, but plausible results were obtained only in the XVII century by gardeners from France and the cultivation was carried out in the surroundings of Paris, in old quarries, from where the stone for construction was once acquired. Galleries were used in which the constant temperature (12-14 oC) and good ventilation was maintained throughout the year. [1].

Becoming the main edible sponge in the world, champignon production began to be widely practiced in other countries as well. Starting in 1918, a superior form of mushroom cultivation was adopted based on Lambert's (USA) technology, which produced mycelium in pure cultures, through spore germination, and thus began the selection of mushroom breeds (sexes) with superior productive qualities. For eight decades the French were the biggest mushroom producers in the world. Currently, along with France, mushrooms are cultivated in commercial quantities in England, Holland, Germany, USA, Belgium, Russia, Hungary, Japan, etc. [2].

Currently, the main producers of Champignon mushrooms are China, Italy, the United States of America, the Netherlands, and Great Britain. Worldwide, about 2,800,000 tons of mushrooms are produced annually. On the European level, approximately 60% of this quantity is produced, or around 1,680,000 tons. On the European continent, the main mushroom producing countries are France, Poland, Italy and Hungary.

In the world industry of mushroom production, three types of production are distinguished, which differ both according to the capacity of work intensification and according to the level of applied investments.

The first type of production shows a massive use of manual labor but with a low level of automation. This method is characteristic for China, where the share of small production enterprises is significant, the level of investment is very low, manual operations predominate, and the harvest for a production cycle is relatively small (12 – 15 kg/m²). Due to the very large number of producers, China manages to produce over one million tons of mushrooms annually.

The second type of production is widely used in the USA and Australia, where initial investments are higher but manual operations predominate. This type can be attributed to semi-industrial production, it is carried out by medium-sized enterprises and can provide relatively high and stable yields.

The third type of mushroom production is based on maximum technological production (up to 85%) and is practiced in the Netherlands. Manual operations are performed only to perform harvesting. This method is defined by massive investment injections and the organization of production enterprises of large economic dimensions [3].

Mushroom production in the Republic of Moldova is mostly characterized by the first type of production. Thus, the share of local mushrooms are produced in small or even auxiliary households, with the maximum application of manual operations. Accordingly, the results obtained do not differ much from those obtained by Chinese manufacturers. The share of domestic enterprises that implement semi-industrial technology is tiny.

The low level of development of the local mushroom production industry is determined by the following factors [4]:

- Lack of adequate financial resources, which would allow businesses to develop;
- Insufficient organization of the industry, especially at the level of producers;
- Lack of regulatory environment;
- Lack of dialogue between different economic agents of the industry;
- There is no access to modern technologies;
- High production initiation costs;
- Lack of a competitive basis for the production of mycelium, compost, etc.;
- Inadequate preservation, storage and marketing infrastructure.

Compared to the main world producers, the quantities of mushrooms produced in the Republic of Moldova are insignificant. The total annual production of native mushrooms is approximately 2000 tons, of which 70% belong to the Champignon species, and 30% to the Pleurotuss (Trout) species. Both species are marketed fresh, and imports are made for processing (approximately 600-700 tons, Champignon species) from China, Poland, Romania and Ukraine. As an example, in 2020 our country imported 567 tons of mushrooms worth 747 thousand USD.

The use of mushrooms in the menu of the local population has an occasional character. If the annual worldwide average of mushroom consumption per person is 2 kg (in the USA and Canada – 2.2 kg, Great Britain – 2.7 kg, France – 3 kg, China – 5 kg), then this indicator for the Republic of Moldova it is approximately 1 kg. But, thanks to the frequent campaigns to promote the consumption of healthy foods,

including the product in question, recently there has been an increase in demand for mushroom preparations. The large variety in different forms (fresh, dried, marinated, thermally processed) only increases the population's interest in this product. This trend proves that mushroom culture has a future in our country.

At the same time, the specifics of the development of mushrooms in the protected environment allow their production both in rooms with limited surfaces, as well as in warehouses, halls, cellars with extended dimensions or, similar to the French, in stone mines in the municipalities of Chisinau, Criuleni or Ialoveni. This fact allows the production of mushrooms both by auxiliary households (family business) and by large specialized enterprises (legal entities).

The short period from sowing to harvesting (60-80 days) allows to obtain 5-6 production cycles, which guarantees a high profitability of the business but also a short period of recovery of the investments used. According to the analysis of economic indicators, carried out by the collaborators of the National Institute of Economic Research in Chisinau as part of the State Program "Elaboration of new economic instruments for evaluating and stimulating the competitiveness of the Republic of Moldova's agriculture for the years 2020-2023" (number - 20.80009.0807.16), the period real recovery of the investments made is equal to 15 production cycles or – 30 months (2.5 years).

An important factor is the accessibility of the raw material necessary for the production of the development substrate. Most of these components are found on the domestic market (straw, poultry litter, malt tusks, soybean meal, fodder chalk, urea, sand), they can be easily procured, the most expensive material being only red and black peat. The share of involvement of mechanized technique in the production of small quantities of substrate is minimal. Instead, large specialized households must own the entire arsenal of mechanized aggregates, because the amount of raw material subjected to processing is of the order of thousands of tons.

The next aspect, which tilts the balance towards a mushroom business, is the non-covering of needs by local producers with raw material for the processing industry (canning, marinating). This situation is fueled by the inability of local producers to ensure the homogeneity of the production obtained but also the quantities requested by the processor. In this case, it is appropriate to develop large specialized households along the lines of those in the USA and Australia, to meet the demands and requirements in force.

As previously noted, due to the specific cyclic fruiting, mushroom production is obtained throughout the year. This fact, as well as the high degree of perishability of mushrooms, requires the determination of a relevant and stable chain of goods production. In the case of the production of fresh mushrooms, it is necessary to conclude prior and long-term contracts with the main manufacturers of food products.

The main directions of making Champignon mushrooms in our country are grocery store chains and local markets. Large store chains have high requirements, such as: product production must have a superior appearance; the mushrooms should be as fresh as possible but also conditioned beforehand; the packaging must meet the requirements and regulations in force; the purchase price should be as favorable as possible to the producer; and most importantly – the producer's ability to consistently provide the producer with the required production quantities. These requirements, in

most cases, can only be met by large manufacturers with a solid technical and material base.

Small producers, due to their reduced capacities both in terms of productivity and product quality, are limited in their activity on the local market, the main direction of achievement being local agricultural markets and small grocery stores.

The retail price of domestic Champignon mushrooms on the domestic market varies depending on the season (the most intense demand is seen in the winter and spring months) and falls within the limits of 35-40 lei/kg. The price range can be influenced by the size and commercial appearance of the mushrooms.

For the processing or preservation industry, other production standards are imposed, manifested by the homogeneity of the mushrooms (size 2-3 cm), the fruit must have a closed cap, the delivered production quantities must correspond to the requested needs. Namely the last argument – the constant provision of primary production processors is the main impediment to the development of the given segment.

In the given context, the majority of domestic producers are oriented towards the production of fresh mushrooms, a fact that extremely limits their scope of activity, and the economic crises of the last period make the given segment even more vulnerable. As a result, in the Republic of Moldova in the last five years the number of companies producing mushrooms decreased by 60%. This fact presents a major risk that in the coming years this branch will completely disappear in our country.

In order to improve the given situation, it is necessary: the direct intervention of the state materialized through the financial support of entrepreneurs; producers must identify and attract massive investments to modernize the production process; it is necessary to organize large specialized enterprises; to diversify the commodity product by adding economic value; producing significant quantities to be able to compete in foreign markets.

Conclusions

1. The exceptional food value, the wide area of use in the field of medicine imposes a constant demand for mushroom products. Mushrooms have one of the shortest vegetation periods of 75-85 days and can offer the advantage of achieving 6-8 harvests per year from the same area throughout the year.

2. In the culture of mushrooms, agricultural land is not necessary, their production being carried out in closed spaces such as unused rooms, warehouses, basements, cellars. Stone mines can be widely used, which currently in the Republic of Moldova constitute approximately 2000 ha and can be successfully organized for the production of mushrooms. When there are no such spaces, modern mushroom houses can be built, made of masonry or thermally insulated solariums.

3. The production of native mushrooms is carried out by small or even auxiliary households, with the maximum application of manual operations. However, due to the recent economic crises, the number of local producers has decreased considerably.

4. In order to rehabilitate the given situation, it is recommended to establish and develop large specialized households on the model of those in the USA and Australia to cope with the demands and requirements in force.

BIBLIOGRAPHY

1. ANDRIEȘ, V., Growing mushrooms, UASM Publishing House, Chisinau, 2002, p. 12-133.
2. The beginnings of mushroom cultivation,
<https://www.gazetadeagricultura.info/plante/ciuperci-si-trufe/18130-inceputurile-si-evolutia-culturilor-de-ciuperci.html>
3. Инновационные технологии и технические средства для производства грибов в защищенном грунте: Метод. реком. -М.: ФГБНУ «Росинформагротех», 2014 -136 с. <https://rosinformagrotech.ru/data/itpk/prochie/send/24-prochie/1351-innovatsionnye-tekhnolo>
4. Guide for businesses – funding sources, <http://dcfta.md/ghid-pentru-afaceri-surse-de-finantare>