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**QUALITY AND SAFETY INDEXES ANALYSIS OF SHIITAKE
CULTIVATION****ПОКАЗАТЕЛИ КАЧЕСТВА И БЕЗОПАСНОСТИ КУЛЬТИВИРУЕМЫХ ШИИТАКЕ****Silonova N.B./ Сілонова Н. Б.***s.b.s., as.prof./к.б.н., доц.***Slyva Y.V./ Слива Ю.В.***s.t.s., as.prof./к.т.н., доц.**National University of life and Environmental sciences of Ukraine,**Kyiv, Heroiv Oborony 15, 03041**Національний університет біоресурсів та природокористування України,**Київ, Героїв Оборони, 15, 03041***Luo Le/Лю Ле***graduate student/студент магистратури*

Abstract: *The state of the normative provision of mushroom production was analyzed, in particular the insufficient number of normative documents concerning the cultivation of mushrooms and those containing the requirements for quality and safety indicators of the finished product were identified.*

Key words: *mushroom cultivation, quality, safety, standards*

Introduction

A constant deficiency of various nutrients negatively affects the general condition of a person, contributes to the appearance of chronic diseases, manifestations of hereditary diseases, and weakening of the functions of the immune system. An important factor in improving the nutritional structure of the population is ensuring not only a balanced complex of proteins, fats, carbohydrates and vitamins, but also the presence of trace elements, biologically active substances and dietary fiber in food products. In this regard, it became necessary to introduce new organisms into the culture - sources of protein, among which edible mushrooms are one of the most valuable.

The implementation of state policy in the field of healthy nutrition of the population of Ukraine is focused on ensuring environmental safety of food products. Recently, the country has observed negative trends in the volume and structure of the human diet. The level of protein intake does not meet established rational standards (0.8-1 g). In this regard, the role of products from natural plant materials, in particular cultivated mushrooms, is growing [1]. According to statistics, the world production of cultivated mushrooms is about 5 million tons per year and over the past 20 years has been increasing by 13-18% annually. About 80 countries are engaged in the cultivation of edible mushrooms on an industrial scale. The largest production volume (about 70%) falls on champignon bisporus (*Agaricus bisporus*), shiitake (*Lentinula edodes*) and oyster mushroom (*Pleurotus ostreatus*).

The share of mushrooms grown in Ukraine is: mushrooms - 60-70%, mushrooms - 30-35%. Shiitake production is also gaining momentum. In total, the same type of production is engaged in about 100 large companies and 1000 small farms. Interest in mushrooms is due to the special taste properties of fruiting bodies



and the presence of a unique complex of biological substances, in particular proteins, food fibers, physiologically active compounds, which provide high nutritional, sorption, oncotic and antioxidant properties that can increase the body's immunity and resistance to viral diseases, reduce the harmful effects of radiation physiotherapy. In many countries (China, Japan, USA, etc.), cultivated mushrooms are used not only as food but also as valuable raw material for the production of therapeutic and prophylactic drugs with a wide range of activities [1].

Today, mushrooms are included in numerous dietary recipes. Proteins of mushrooms occupy an intermediate place between proteins of vegetable and animal origin. The biological value of mushroom proteins is considered through the optimal quantitative ratio of 20 amino acids, the combination of which best meets the needs of the human body. In the presence of carbohydrates from urea contained in mushrooms (up to 13%), amino acids can be synthesized [2,4].

Table 1

List of mushroom production standards harmonized in Ukraine

Type	№	Name
65.020.2 0plant growing	1	DSTU 7316: 2013 Substrate mycelium of edible mushrooms. Specifications
	2	DSTU 8511: 2015 Mushroom mushrooms. Growing technology. general requirements
67.080. - Fruits, vegetables and processing products	3	DSTU 4696: 2006 Canned food. The mushrooms are marinated and boiled. Specifications
	4	DSTU 7786: 2015 Mushrooms. Fresh mushroom. Specifications
	5	UNECE DSTU FFV-24: 2007 Mushrooms cultivated (Agaricus). Supply and quality control guidelines
	6	UNECE DSTU FFV-54: 2007 Mushrooms are white. Supply and quality control guidelines
	7	UNECE DSTU FFV-53: 2007 Fresh truffles. Supply and quality control guidelines
	8	DSTU ISO 7561-2001 Mushrooms cultivated. Guidelines for storage and transportation under cooling conditions
	9	GOST 13799-81 Canned fruits, berries, vegetables and mushrooms. Packaging, marking, transportation and storage
	10	DSTU 8568: 2015 Frozen fruits, vegetables and processed products. Packaging, marking, transportation and storage
	11	DSTU 8636: 2016 Frozen vegetables. General specifications
	12	DSTU ISO 3659: 2005 Fruits and vegetables. Ripening after storage in the cold.

The regulatory documents used for the examination of mushrooms provide a list of regulated indicators. These are organoleptic indicators: appearance; coloring of the surface of the cap, plates and legs, taste and smell. From physical indicators determine the size of the cap and legs of the mushroom, the presence of impurities in the batch of mushrooms; from chemical - the presence of heavy metals, pesticides, radionuclides) guaranteeing product safety.

The appearance of the fungus is a complex indicator, including the state of the fruiting body as a whole, the surface of the cap and legs, the shape of the cap and legs. If a mismatch is found for this indicator, then the determination of the remaining



indicators becomes inappropriate.

The regulatory documents for oyster mushrooms offer a detailed description of the appearance of the mushrooms, in particular, forms of hats, their location on the splice, as well as structural features of the legs of the mushroom are taken into account. All these features depend, in turn, on the strain culture of the fungus, which was used for growing seed crops of mycelium.

Taking into account the above-mentioned recommendations, the requirements for the appearance of cultivated shiitake were determined, in particular mushrooms should be whole, clean, not washed, healthy, elastic, fresh in appearance, without excessive external humidity, not frozen, without damage caused by agricultural pests, knives, or pests in cut shiitake, the cut must be clean, uncut mushrooms may have traces of hothouse material at the base of the leg. junctions.

Thus, the analysis of the state of the normative provision of mushroom production was carried out, in particular it was determined that a normative document was developed at the national level containing requirements for all substrates applicable in mushroom production. As for the requirements for mushrooms as products, in Ukraine the technical conditions have been developed only for the fungus of ordinary fresh, but in the national standard there are no requirements for the mushroom, which is becoming more and more popular - shiitake.

References

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Проведено аналіз стану нормативного забезпечення виробництва грибів, зокрема визначено недостатню кількість нормативних документів, що стосуються культивування грибів, та таких, що містили б вимоги до показників якості та безпечності готового продукту

Ключові слова: вирощування грибів, якість, безпечність, стандарти.

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