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# Agricultural Export Risks for Uzbekistan. (Part 1)

### Radjabov M\*

Faculty of Chemical Technology, Urgench State University, Urgench, Khorezm, Uzbekistan

\*Corresponding Author: Ajala AS, Department of Food Science and Engineering, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria. Received: March 03, 2020 Published: March 17, 2020 © All rights are reserved by Radjabov M.

## Abstract

The article discusses risks that may adversely affect the export of agricultural products and an action plan necessary to reduce these risks.

Keywords: Heavy Metals; Pesticides; Exports; Health; Gourds; Salt; Storm

#### Introduction

Melon (*Cucumis melo* or literally "puffed fruit") is a false berry or vegetable belonging to the pumpkin family. Her closest relatives are cucumber and pumpkin. This annual melon crop has several hundred varieties of various shapes, sizes and colors. Melon has been known to mankind since ancient Egypt, before it was wild, then it was cultivated, and today the differences between the varieties are the degree of sweetness, the ripening period and the time of preservation of the taste and useful qualities of the melon.

And, of course, our Uzbek melons have been known for several centuries. The most delicious melons in the world are grown in Central Asia. Professor Y. Gulomov explained the secret of the sweetness of Khorezm melons "Such a sweetness of Khorezm melons can be explained by the water of the magical Amu Darya and the chemical characteristics of the soil of Khorezm". They are very demanding on light and heat. Juicy melon perfectly quenches thirst. It is rich in sugar, protein, starch, which is easy to digest, and can easily replace a full meal. Only 150 g of melon contains the daily intake of folic acid. It has a lot of silicon, vitamin C, carotene, organic acids, mineral salts of potassium, sodium and iron, due to which this seasonal product normalizes the composition of the blood and soothes the nervous system. Melon fiber and pectin substances act as a mild laxative, cleansing the body of bad cholesterol. The simplest and most reliable method in the processing and preserving of agricultural products, allowing to extend their shelf life and ensure a rational supply of food products to the population of our country and countries importing products, is drying. Dried melon is rich in nutrients necessary for normal functioning of the human body.

It is known that the fruits of garden and melon crops, as well as the products of their processing, are in steady demand, both in the domestic and foreign markets. According to the physiological norm of nutrition, one person should consume 7.5 - 10 g of dry foods daily [1].

In the segment of dried fruits and vegetables, the absolute leader in export volumes of \$ 2.8 billion, 341 thousand tons, 65% of the market is China. World melon production is about 14 million tons, with an average yield of 15.0 t/ha. China ranks first in gross collection (2.5 million tons) [2]. The volume of supplies of the closest competitor - the USA - is 13 times less. The leading buyers of dried vegetable products - Vietnam and Japan together form a third of world imports in this product group. Vegetable preserves are a relatively small segment (\$ 617 million in the whole world in 2015). Leading suppliers are China and India. The largest consumers are Italy and Japan. Russia buys \$ 14 million in vegetable preserves.

The presence of significant areas of agricultural land, irrigated arable land, heat, light, water sources, various types of soils, centuries-old agricultural experience of the population predetermined the set of crops, their agricultural machinery and modern production technologies. The products of the leading branches of agriculture - vegetable growing, rice growing and melon growing - are intended both for personal use and for export outside the country. With its unique natural resources, Uzbekistan can occupy a significant part of the global market for dried products. For the production of high-quality competitive dried products, their processing and sale in Uzbekistan, a number of draft laws, regulatory and legal acts of the Government have been developed [3-5].

The aim of our work was to analyze the content of Pesticides and HM in gourds of Uzbekistan. The concentration of heavy metals is influenced by soil properties. The soil is in constant interaction with other ecological systems - the atmospheric, hydrosphere, plant world and is an important source of HM in the human body. HMs that entered the soil during their active extraction from the soil by the root system can accumulate in agricultural crops, and when washed out by surface waters, it is concentrated in aquatic organisms and bottom sediments. It was found that metals accumulate relatively quickly in the soil and are removed very slowly from it. The first half-removal period (i.e., removal of half from the initial concentration) of HM varies significantly among various elements and takes a very long period of time: for zinc - from 70 to 510 years; cadmium - from 13 to 110 years, copper - from 310 to 1,500 years, lead - from 770 to 5,900 years. In soils of heavy particle size distribution, as a rule, higher concentrations of HM are found, sandy and sandy loam soils accumulate them to a lesser extent. The acid-base properties of soils have a significant effect. Under acidic conditions, the insoluble part of the TM fraction passes into soluble forms, thereby the concentration of TM in acidic soils can increase [6].

In Urgench State University, the products of (2017) melon breeding were studied in various regions of the Khorezm region of Uzbekistan (Table 1), which show the contents of Cd, Pb, As, Hg (mg/kg) in melons ( $M \pm \sigma$ ), namely, the "Qarri qiz" variety.

Heavy metals	Melon	Maximum permissible concentration
Cd	0,0087 ± 0,0026	0,03
Pb	0,079 ± 0,023	0,5
As	0,006 ± 0,002	0,2
Hg	0,0038 ± 0,0012	0,02

Table 1

The figure shows a map of Uzbekistan's pollution with pesticides (for 2008).



## **Results and Discussion**

The main risks in the quality of dried products, besides organoleptic indicators, are; 1) nitrates with a permissible norm of 90 mg per kg, 2) heavy metals with a maximum permissible norm of Cd

- 0.03 mg/kg, Pb - 0.5 mg/kg, As - 0.2 mg/kg, Hg - 0, 02 mg/kg. If the solution of the first indicator can be controlled with agro-technological cultivation and quantitative indicators of the use of fertilizers and pesticides, then in the second there are many factors. As a result of heavy traffic along highways, peculiar technogenic anomalies are formed. Soils of the roadside zone contain several tens and even hundreds of times more zinc and copper than soils remote from highways. In the roadside, the accumulation of HM in fodder and vegetable plants often reaches a level that has a harmful effect on the human body and animals. Metal ions are indispensable components of natural water reservoirs. Sources of TM water pollution are sewage from galvanic shops, insufficiently treated sewage, effluents from industrial enterprises and surface runoff from the city. HMs are part of fertilizers and pesticides and can enter water bodies along with runoff from agricultural land. It is necessary to take into account another cataclysm (ecological catastrophe), new for Central Asia, that is salt storms. The first of which occurred on May 26-27, 2018 and covered the northern parts of Uzbekistan and Turkmenistan. Tons of salts with heavy metals rising from the dried bottom of the Aral Sea.

Figure 2: Source: Akeura F., Alixanov B., Nasridinov A., va boshkalar. "O'zbekistonda atrof muhit holatini eklolgik mezonlari (indikatorlar) bo'yicha baholash atlasi" -Tashkent. "Kartografiya". (2008): 13c.

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Drying is considered complete when the melon does not produce juice when compressed, i.e. it will have a moisture content of about 20%. The average yield of finished products is 7 - 8% of the mass of raw materials [7,8]. The yield of finished products depends on ripeness and variety, mainly on the sugar content. To obtain 1 ton of dried pulp of melon requires from 11.7 to 15.2 tons of fresh fruit [1]. With a decrease in volume and humidity, the dried melon becomes sweeter, but the concentration indices of nitrates and heavy metals increase several times.

#### Conclusion

After a discussion on improving the situation when exporting oriented products was grown, we came to the conclusion that it is necessary to create road safety maps for planting products (taking into account the location of highways, large industries and wind directions), improving (landscaping) the condition of the bottom of the Aral Sea (a lot of work is carried out by the government of Uzbekistan [9], increasing the area of crops in enclosed spaces (in hotbeds), familiarizing and training farmers and teachers in planting methods in enclosed spaces (recently in Urgench State University lectured by a professor from the University of Padua, Paolo Sambo).

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