

## ECONOMIC ASPECTS OF QUINOA TRADE BETWEEN PERU AND THE EUROPEAN UNION

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### Abstract

*The paper points out the quinoa trade between Peru and the European Union regarding selected economic issues of quinoa production and prices in Peru and import into the EU. Quinoa is known as superfood due to the high level of protein, fibre, micronutrients, and all amino acids. This caused an increased interest in its consumption in the EU which resulted in rising prices. High quinoa prices have motivated farmers in different parts of the world to try producing quinoa that is traditionally home to areas in South America. The increase in the quantity of quinoa offered led to its fall in prices. Quinoa price volatility creates uncertainty for Peruvian farmers and traders, for whom quinoa is one of the main commodities. The article focuses on the development of quinoa production and prices in Peru, a country that is one of the main producers of quinoa in the world at a time when quinoa has become a popular superfood. During this period, imports of quinoa into the EU, which is a major trading partner of Peru in relation to the quinoa, also increased. Based on the assessed economic situation in the quinoa market between Peru and the EU, the authors of the article are looking for tools that could make it easier for Peruvian farmers to be successfully established in the EU market, despite the high interest in growing this commodity in different parts of the world.*

**Key words:** quinoa, trade, prices, Peru, European Union market, economic aspects

### INTRODUCTION

Quinoa (*Chenopodium quinoa*) is an Andean crop of great importance in supplying essential amino acids, protein, starch, and ash [32]. It is gluten-free and has twice as much protein as maize, barley and wheat [30], [33] and more micronutrients than wheat, rice or barley [24]. In 21<sup>st</sup> century, quinoa has earned special attention worldwide not only due to these nutritional and health benefits but also due to its ability to adapt to contrasting environments, including nutrient-poor and saline soils and drought-stressed marginal agroecosystems [14]. Moreover, quinoa is also resistant to cold [2]. Although Peru and Bolivia are still the most important global exporters, quinoa cultivation has spread to more than 120 countries. Production outside

the Andes is increasing, and farmers from Peru and Bolivia face a scenario of new concerns and competitors [1]. However, variability of climatic conditions, such as hails, frosts, droughts, floods, or high temperatures, determine total production levels [34], [11], [35], [5], [22]. Moreover, the environmental conditions and location can affect the nutritional parameters (e.g. the amino acid profile, the protein content, the mineral composition) [29], [13]. This means that even though quinoa is a relatively undemanding plant, it is not possible to grow it everywhere. On the other hand, the natural and environmental conditions alone will not ensure the primacy in quinoa cultivation for the Andean countries in the future without improving the economics of quinoa cultivation. In the Andean countries, quinoa is

produced by small-scale producers (with land acreage up to 10 ha), and due to their scale of production, they lack the capacity to export or commercialize the product in larger markets; the bargaining power to negotiate better prices and other conditions; and the ability to meet the quality and safety standards of larger and more demanding markets [10].

The aim of the article is to find out tools that could make it easier for Peruvian farmers to be successfully established in the EU market, despite the growing interest in growing this commodity in different parts of the world.

## MATERIALS AND METHODS

We used the statistical data relate to the quinoa international trade from trade statistics database of the EU and Agriculture Ministry of Perú from 2013 - 2021. Moreover, we used the appropriate normative EU legal acts relating to the trade between Peru and the EU and relevant political documents as well as scientific publications on quinoa.

The statistical data related to the quinoa import (quantity and value of quinoa import from third countries, mainly from Peru in the EU in 2012-2021) are presented in the figures with the use of methods of basic statistical analysis and statistical induction methods (non-parametric Kruskal – Walis test) for evaluation of statistically significant differences among the quinoa prices from the various part of the world. For the legal and political documents, jurisprudence methods such as logical and formal legal methods were used and sociological methods to find the legislative and political tools of supporting farmers from Peru to establish them on the European market.

## RESULTS AND DISCUSSIONS

### Quinoa production and market in Peru

Quinoa was domesticated in the Andean region of South America (mainly in Bolivia and Peru around Lake Titicaca) 5,000 years ago [7] by the Aymara and Quechua, pre-Inca civilizations [15] that traditionally use quinoa for nourishment. Quinoa (its seeds) was originally used only to feed animals. Later,

people began to use quinoa also for their own consumption. Moreover, the Inca civilisation considered quinoa a sacred food [12] and was used for their religious ceremonies. With the arrival of the Spanish conquerors, quinoa was replaced by other crops and fell into oblivion. Quinoa was rediscovered in the 70s of the 20th century. By 2013, which was the international year of quinoa, the production and consumption of quinoa increased exponentially [4]. However, quinoa was widely consumed in the EU long before. The European Commission, in its Novel Food Catalogue, stated that quinoa does not require authorisation under the Novel Food Regulation (EC) 258/97 as it is widely consumed and to a great extent before the legislation came into force on 15th of May 1997 [28]. Nowadays, quinoa has gained recent attention as a ‘superfood’ [29] because it is gluten-free, and contains a high level of protein, minerals, fibre, antioxidants and vitamins [37]. Quinoa has good quality lipid, starch and mineral compositions and is rich in saponins [19], [31].

Quinoa is the seed from the *Chenopodium quinoa* from the amaranth family. The classification of quinoa was first made from the plant's colour and seeds [18]. Nowadays, in addition to the traditional colours (white, red, and black), there are purple, pink, grey, orange, green, and yellow colours of quinoa seeds. Different types of quinoa exist in the Andean region whose characteristics vary among agroecological zones, e.g. the Altiplano (northern Andean highlands); the shore of salt lakes (southern Andean highlands); the inter-Andean valleys; arid zones and dry conditions (eastern Andean highlands); high altitudes and cool climates; coastal regions and near the sea; jungle and tropical zones; high rainfall and humidity zones [6].

Quinoa tolerates a wide range of acidic soil conditions [18] and a wide range of temperatures from around  $-8^{\circ}\text{C}$  up to  $+38^{\circ}\text{C}$  [6]. Quinoa is frost resistant, but also before flowering, because the frost may occur significant damages on the yields [17]. The other special characteristics of quinoa are drought resistance and adaptation to saline

and sandy soils, enabling quinoa cultivation in deserts' extreme conditions [6]. Quinoa is able to be cultivated even in regions where the annual rainfall is in the range of 200–400 mm [36]. The quinoa seed collection and purification in the Andes is time and labour-intensive and is carried out mainly manually by traditional methods [8]. Peru's average quinoa yield per hectare of land was 1.40 tons during 2013 - 2021. It ranged from 1.16 tons in 2013 to 1.68 tons in 2014. In 2021, the average quinoa yields were 1.57 tons per hectare of land [26]. In 2013, quinoa was cultivated on an area of 45,000 ha. After the international year of quinoa, the acreage of land for quinoa cultivation has been increased by half. The acreage of land for quinoa cultivation ranges from 61,721 to 69,303 between 2014 – 2021.

Peru is the world's largest producer of quinoa and produces more than half of the world's supply. The second largest producer is Bolivia that produces a third of the world's production. One of the most important quinoa trade partners of Peru and Bolivia is the European Union. A third of the Peru's quinoa production is imported into the EU (Fig. 1).

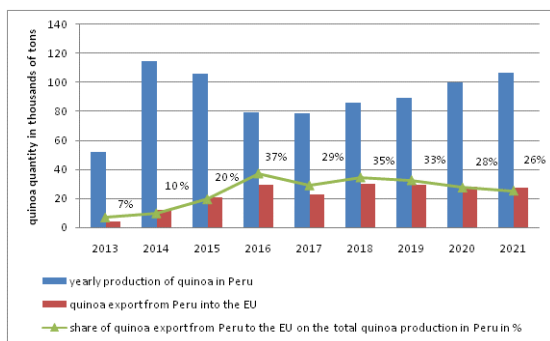


Fig. 1. Quinoa production in Peru 2013- 2021

Source: [9, 26].

The international year of quinoa (2013) caused an increased demand for quinoa on the international market what contributed to tripling the quinoa prices on the world markets.

However, the quinoa prices fell in 2015 due to increasing supply from Peru and Bolivia on the one hand and from other countries on the other hand. Quinoa cultivation has spread to more than 120 countries that were encouraged by the high prices and increased demand to

start cultivating quinoa. The price development is documented in Fig. 2.

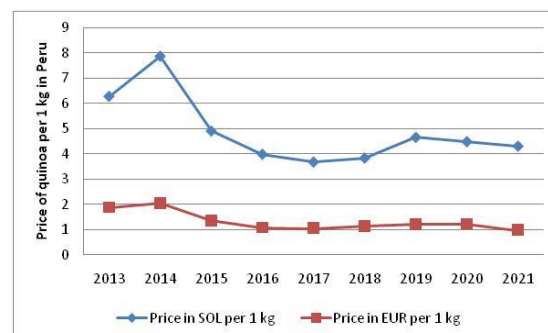


Fig. 2. Quinoa prices in Peru in 2013- 2021

Source: [9].

This situation has affected quinoa consumption in Peruvian households and their production decisions [16]. According to [21] the rapid increase in quinoa prices following the increased international attention to quinoa as a “superfood” and the increased international trade in quinoa created concern about the welfare effects for (often poor) people in Andean regions, where quinoa originates from. According to [17] this brings new competitors to the Andean region, where quinoa is produced in both traditional and intensive production systems. Therefore, the main challenges for Peruvian farmers are volatile yields, low levels of technology, fragile ecosystems and unclear rules on sharing the benefits of conserving Andean genetic resources. One solution to these challenges could be the EU's quality policy, as Peru is a major partner in the quinoa trade. Moreover, European consumers tend to attach more importance to food quality, leading to increased demands for agricultural products or foodstuffs. The EU has adopted Regulation no. 1151/2012 on quality schemes for agricultural products and foodstuffs that should provide producers with the right tools to identify and promote products with specific characteristics while protecting them against unfair practices. The citizens of the third countries can also use these tools for delivering products to the EU. There are three important tools related to the agricultural products and food: protected designations of origin, protected geographical indications and traditional specialities guaranteed. The first

and second terms could be used when identifying a product originating in a specific place, region or country whose

-quality or characteristics are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors; and the production steps of which all take place in the defined geographical area (designation of origin).

-whose given quality, reputation or other characteristic is essentially attributable to its geographical origin; and at least one of the production steps of which take place in the defined geographical area (geographical indication).

The results of [29] revealed that several nutritional parameters such as the amino acid profile, the protein content, the mineral composition and the phytate amount in the seeds depend on the location and cultivar [13] presented a significant influence of the environmental conditions on the nutritional and physiological characteristics of quinoa seeds, which affects overall seed quality. It means that the specific Andean location is able to influence the quality, characteristic or reputation of quinoa to receive the protected designation of the EU.

The third mentioned tool - traditional specialities guaranteed - is established to safeguard traditional methods of production and recipes by helping producers of traditional products in marketing and communicating the value-adding attributes of their traditional recipes and products to consumers. It means that the traditional methods of production and recipes for cultivation and production of quinoa can be maintained and protected by the scheme of the EU quality policy. In addition, products under the quality scheme of the EU are considered by EU consumers to be of higher quality and therefore a higher price can be expected. Moreover, the quality of quinoa can be supported by the nutrition claims that can be used for quinoa [20].

### Peruvian Quinoa import into the European Union and Slovakia

The import of quinoa to the EU started to develop more intensively in 2012. After the economic crisis, the people in the EU have

been interested in healthy food, and quinoa has become a very popular superfood. The import of quinoa from South America, mainly Peru and Bolivia, has increased by more than 100%. Statistics on quinoa imports were unavailable before 2012, but 207,000 tonnes of quinoa were imported into the EU between 2012 and 2021 from over the world. Of it, 85.29% was imported from Bolivia and Peru. The import of quinoa from these two countries increased during the followed period 2012 – 2021. One of the measures to support the quinoa import to the EU was the agreement concluded between the EU and its countries on the one hand and Peru and Bolivia on the other. Generally, the common custom tariff for quinoa imported into the EU from the third countries is 37 Eur per ton. However, the EU and Peru together with Colombia had concluded the trade agreement between the EU and its Member States, of the one part and Colombia and Peru, of the other part, which is applied in Peru since 1<sup>st</sup> March 2013 and in Colombia since 1<sup>st</sup> August 2013 and Ecuador accessed to this Agreement since 1<sup>st</sup> January 2017 (L354/3). According to this agreement, the tariff preference for Peru is zero percentage. The development of quinoa import to the EU in 2012-2021 is documented in Figure 3.

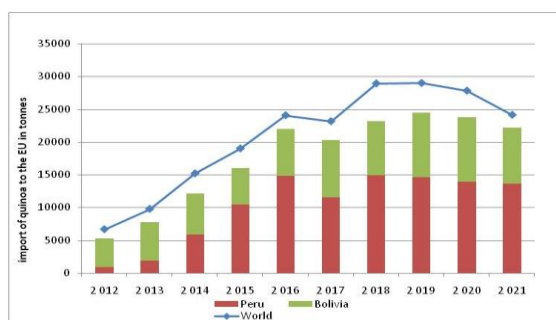


Fig. 3. Quinoa import to the EU in 2012- 2021  
Source: [9].

According to Figure 3, the most quinoa is imported from Peru (on average 44.63 %) and Bolivia (39.81%) to the EU in the period 2012 – 2021. Only 15.56 % of quinoa import is from other countries of the world, such as Ecuador, Brazil, Chile, Colombia, Mexico, Canada, USA, Russia, India, China, Egypt, Israel, South Africa, Zambia, Turkey, Norway, Switzerland, or United Kingdom.

After quinoa became a popular superfood, its prices on the European market rose (Figure 4). The average imported prices of quinoa were very similar (slightly lower) to the prices of quinoa imported from Peru or Bolivia to the EU; however, there is no statistically significant difference.

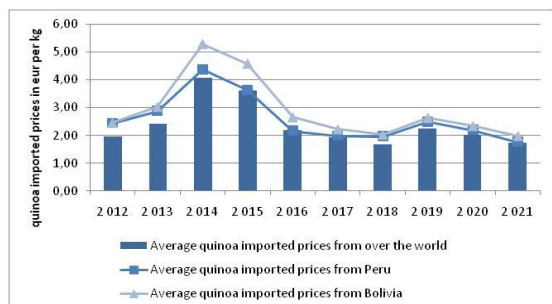


Fig. 4. Quinoa imported prices to the EU in 2012- 2021  
Source: [9].

Quinoa has become most popular in the Germany, Netherlands and France which covered 63.25% of quinoa import in 2021 from over the world (Figure 5). Slovakia imported only 0.09 % of all imported quinoa in the EU.

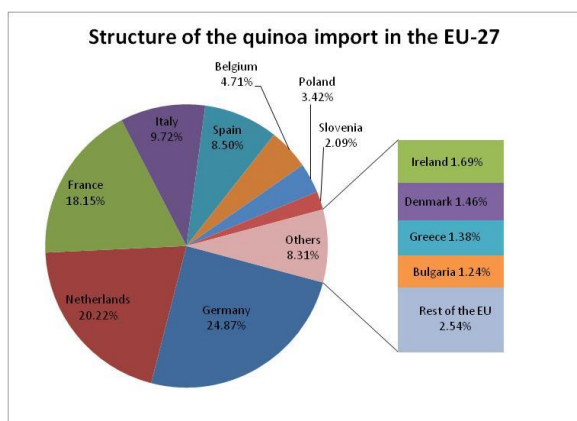


Fig. 5. Structure of the total quantity import of quinoa in the EU-27 in 2021  
Source: [9].

Peru was the most important importer of quinoa into the EU in 2021. Of all quinoa imports, Peru covered 56.63% of the imported quinoa from over the world. Slovakia imports quinoa only from Peru. However the quantity of imported quinoa to Slovakia is still very low compared to the other EU countries (0.16 % of all quinoa imports from Peru to the EU internal market in 2021). The structure of

import from Peru to the particular member states of the EU in 2021 is documented in Figure 6.

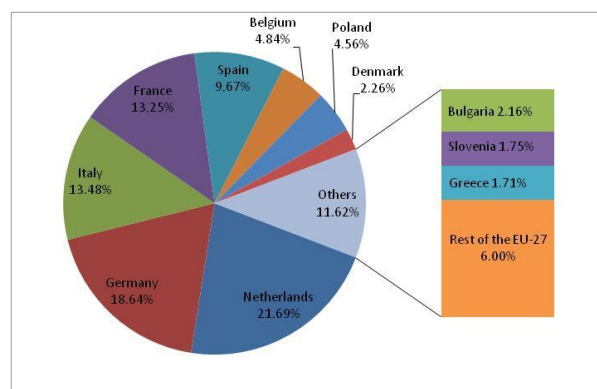


Fig. 6. Structure of the Peru quinoa import in the EU-27 in 2021  
Source: [9].

Quinoa was imported first time to Slovakia in 2015 (40 tons from Peru). In the period 2016 - 2021, quinoa imports fell by almost half (Figure 7). All quinoa is imported to Slovakia only from Peru, although the EU-27 also imports quinoa from other countries of the world, especially from Colombia and Ecuador.

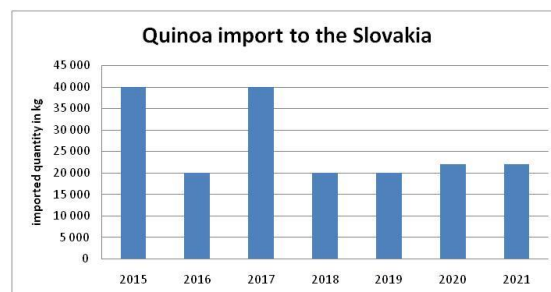


Fig. 7. Quantity of imported quinoa from Peru to Slovakia  
Source: [9].

The imported prices of quinoa from Peru are slightly higher than the average world prices of quinoa. On the other hand, the quinoa prices imported from Peru to Slovakia are slightly lower than the quinoa prices imported from Peru to EU-27 (Figure 8). In 2015- 2021 the average quinoa prices in Slovakia ranged from 1.64 EUR per 1 kg to 3.14 EUR per kg, while quinoa prices in the EU-27 imported from Peru ranged from 1.76 EUR per 1 kg to 3.62 EUR per 1 kg. However, there are no



statistically significant differences between the compared prices of quinoa.

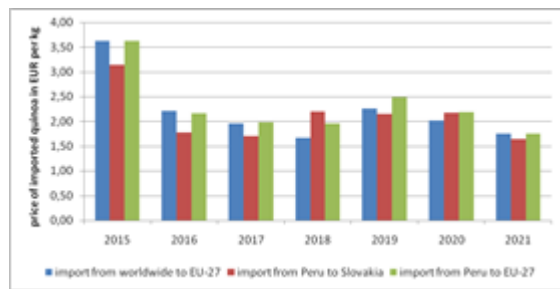


Fig. 8. Price comparison of imported quinoa to the EU-27 and Slovakia

Source: [9].

Despite quinoa's price volatility during the following period, Peru has become the most important trade partner of the EU concerning quinoa import (Figure 8). However, stable quinoa prices are important for small Peruvian farmers who cultivate the quinoa by traditional methods on a very small acreage of land. In fact, there are up to 65% of small farmers in the Peru, who manage an area of 2.49 ha on average; of which they grow quinoa only on an area with an average of about 0.51 ha. The average annual quinoa production of a small farmer is approximately 314 kg. Only 35% of medium-sized farmers in Peru farm on an average of 3.85 ha, of which they use an average of 1.33 ha of land for quinoa production. The average annual quinoa production of a medium-sized farmer is approximately 1089.3 kg [25].

However, if we consider minimum wage in Peru in 2022 (1,025 SOL per month or 12,300 SOL per year; if 1 EUR is 4 SOL on average, then the minimum wage is 3,075 EUR per year or 256 EUR per month), the quinoa price (4.31 SOL (1.08 EUR) per 1 kg in 2021 and 3.50 SOL (0.875 EUR) per 1 kg as a minimum price during the period 2013 – 2021) and yields from one hectare of land (1.4 tons per 1 ha on average during 2013 – 2021 and 0.4 tons per 1 ha according to [1]), for quinoa cultivation, the Peruvian farmers need land of acreage from 2.04 ha in the best case of prices and yields to 8.79 ha in the case of 3.50 SOL per 1 kg and yields 0.4 tons per 1 ha of land. According to the data [25], only 35% of farmers would be able to receive a minimum yearly wage from quinoa

cultivation and only in the case of the best conditions of yields and prices. In general, the average yields from one hectare of land are 1.4 tons; however, in 2015, yields of quinoa ranged from 0.4 to 1.1 tons per one hectare of land [1]. Moreover, the purchase price of quinoa from very small farmers could be lower than the average quinoa prices on the market due to the small quantity they supply. Therefore, the small Peruvian farmers need to increase their negotiate power in relation to the quinoa prices by establishing their farmers associations which will be able to stabilise the purchase prices for small farmers. Moreover, such associations would be able to protect business interest of their members and provide them various services necessary for their business, such as storage of quinoa when the demand is decreasing, marketing or administration advices, obtaining certification of origin, traditional specialty guarantee, or regional trademark, organisation of educational or training courses, extension services together with agrarian universities, advices on increasing the quality of production, sale promotion or processing promotion, because selling quinoa may not be the only solution for Peruvian farmers. The added value of quinoa could be increased by the production of traditional, regional or new modern products, e.g. quinoa flour and bread, quinoa crisps, quinoa sauces, quinoa powders, and quinoa snacks. But small farmers would not be able to produce the final quinoa products without the special help of farmers' associations. Further, adding value to quinoa and its final products can be achieved in connection with the development of services, mainly tourism, rural tourism or agroecotourism, with the presentation of history, tradition and cultures associated with quinoa, e.g. [3] or [27]. Moreover, farmers' associations would be able to support the export not only quinoa seed but also the final products of quinoa on the world markets. However, such farmers' associations (mainly on the regional, national or international level) need to be familiar with the legal export regulations in relation to quinoa. In the EU, despite the conclusion of an agreement with Peru that eliminated quinoa tariffs, there are

many EU legal acts that importers of quinoa from the third countries to the EU must follow. There are food safety and quality requirements (HACCP, phytosanitary regulations, limits for agro-chemicals, contaminants, microbiological criteria, GMO, food law), food labelling, organic labels and nutrition and health claims, food packaging and shipment. Food products, including quinoa, are relatively often repacked to be in harmony with the EU legislation. But it increases the additional costs in connection to waste management [23]. In any case, it is very difficult to be familiar with all different EU legal regulations and their amendments. If it is not possible to simplify this legislation, the importers would certainly appreciate a manual with all relevant legal acts in one place related to the quinoa import to the EU that would be regularly updated. The website of the European Commission Access2Markets is a particular help for foreign trade partners [9].

## CONCLUSIONS

Quinoa, considered a superfood of 21<sup>st</sup> century, is a traditional pseudo cereal of inhabitants in the Andean rural areas. It is an undemanding crop; therefore, there are attempts to grow it in other parts of the world. Nevertheless, Peru and Bolivia remain the largest producers and exporters of quinoa in the world and important trade partners in quinoa for the EU-27. However, in order to maintain the lead in the still traditional cultivation of quinoa in these countries, it would be appropriate to consider using the quality schemes provided by the EU in the form of protected designation of origin, geographical indications or traditional specialities guaranteed. In addition, to stabilize prices for farmers, it is necessary for farmers to increase their bargaining power in the market by building farmer associations which would be able to represent their interests in the market, support their business intentions and help with the foreign legislation, mainly the very strict EU legislation. Despite the conclusion of an agreement with Peru that eliminated quinoa tariffs, there are many EU legal acts that

importers of quinoa from the third countries to the EU have to follow. In any case, it is very difficult to be familiar with all different EU legal regulations and their amendments. The website of the European Commission Access2Markets is a particular help also for Peruvian exporters of quinoa.

On the other hand, quinoa is also considered fundamental in guaranteeing food security and eradicating hunger. Therefore Andean countries should not forget about their own consumption and promotion of healthy eating when exporting quinoa and placing it on world markets. To improve quinoa consumption by nationals, Andean countries can promote national programs (e.g. school meals) or recovery of traditional ways of consumption or promote innovative products that include quinoa as an ingredient [1]. It should be the route that will ensure the preservation of the Andean countries' cultural and gastronomic traditions and cultural heritage as the original growers of quinoa. This fact can attract tourists, experts in gastronomy and food industry, which will lead not only to the growth of tourism in these rural areas, but also to the support of the production and sale of local products with higher added value, the final price and, finally, a higher income for local farmers.

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