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AGRI-FOOD PRODUCTS QUALITY AS EXPORTS COMPETITIVENESS DETERMINANT OF THE REPUBLIC OF SERBIA

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Abstract. *Products quality and safety are important determinants of countries' export competitiveness. Issues of the quality of agri-food products are gaining more and more importance, bearing in mind modern challenges and consumer needs. This is very important for developing countries, including the Republic of Serbia, bearing in mind the importance of this sector for exports and overall economic development. On the other hand, these countries are lagging behind developed countries in terms of quality standards, due to the expensive certification and quality standardization procedures. The growth of competitiveness should be achieved through the improvement of product quality standards, product differentiation and introduction of innovations in the agri-food sector. The goal of the research is to examine the quality of the most important export agri-food products of the Republic of Serbia. The unit value (UV) index, as a measure of product quality, is used to analyse the quality of the most important agri-food products on the most important export markets, with using secondary ITC data. The multiple regression determined that the improvement of agricultural products quality has a positive impact on the growth of exports and competitiveness of agri-food sector of the Republic of Serbia. Namely, the competitiveness of agri-food sector will depend primarily on the ability of this sector to respond to the requirements related to food safety and quality standards, as well as the possibility of investing and innovating processing capacities, in order to create a high-quality final product with high value added.*

Key words: *quality, UV (unit values) index, competitiveness, export, agri-food sector*

JEL Classification: L15, O10, O32, Q10

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INTRODUCTION

Nowadays, the topics of food safety and quality are very important. That is conditioned by growing consumer concern about food properties and growing awareness of the connection between food and health. In this context, the competition on the agri-food markets is increasingly shifting from price to quality. Consequently, strategies have been oriented towards increasing efficiency and quality control. There is a strong connection between competitiveness and product quality, i.e., it is believed that an increase in competitiveness can lead to an improvement in product quality (Curzi et al., 2014), and vice versa.

The quality of agri-food products, as well as the attributes that define it, have been developing for decades, and discussions related to this topic have focused a lot on issues related to the standardization of quality attributes (Rossi Scalco et al., 2020). Bearing in mind that improving the quality of products is very important for increasing the competitiveness of agri-food sector, the literature emphasizes that the application of innovative approaches in this area is necessary.

The subject of this paper is to determine the most important sectors and products of agricultural exports of the Republic of Serbia. The goal of the paper is to point out the high quality agricultural products of the Republic of Serbia and their importance for export and economic development. According to the subject and goal of the research, the following research hypotheses were established:

H_1: The high quality agricultural products have a significant impact on the export markets of the most important trade partners of the Republic of Serbia.

H_2: Improving the quality of agricultural products has a positive impact on the growth of exports and the competitiveness of the agri-food sector.

1. LITERATURE REVIEW

In the context of international trade, the standards of agri-food products are increasingly becoming a global phenomenon (Reardon & Berdegué, 2002). The agri-food sector is increasingly burdened by requirements regarding food safety and quality standards. Quality standards have evolved in response to consumer concerns about the quality of the food they consume (Henson & Hooker, 2001).

Many modern agri-food markets are structured in such a way that competition is mainly focused on quality (Busch & Bain, 2004). Consumers are increasingly focusing on a wider range of product attributes. These quality attributes include the way of production (organic production, animal care, etc.), the composition (pesticide residues, etc.), as well as broader implications of the agri-food on the environment. That is why the increasing focus of agri-food markets is centered on safety and quality of food (Henson & Reardon, 2005).

Quality is generally explained as the totality of product characteristics related to its ability to satisfy implied needs (Aung & Chang, 2014). Grades and quality standards consist of a set of terms and principles of classification and marking. Grades and standards refer to: quality (appearance, cleanliness, taste, etc.); safety (pesticides residues or other artificial substances, presence of microbes, etc.); authenticity (guarantee of geographical origin or application of traditional production methods); production process that respects the health and safety of people, as well as environmental protection (Reardon & Farina, 2001).

Although there are significant differences between food quality and safety, clear distinctions are often not made between these concepts (Röhr et al., 2005). These issues are increasingly important in the agri-food markets, as product quality has become an essential requirement for consumers (Grunert, 2005), so competition in the agri-food markets often shifts from price to quality and safety.

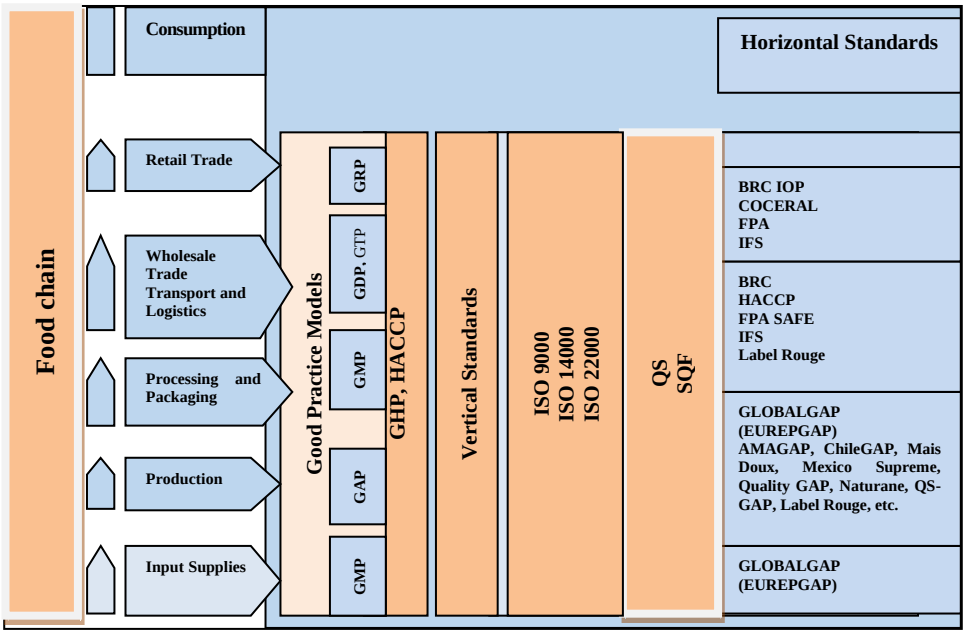

Fig. 1 Food quality standards
Source: Aung & Chang, 2014, p. 177.

Food safety and quality standards (Fig. 1) depend on specific requirements aimed at consumer welfare (Swinnen & Vandemoortele, 2009). As a result of modern consumer preferences, which imply a higher level of food safety and quality (De Moura et. al., 2009), global agricultural markets have become increasingly complex. Therefore, many companies focus on value-adding activities, offering high-quality and differentiated products (Cucagnaa & Goldsmith, 2018). Among food producers, vertical coordination becomes crucial to ensure access to a stable supply of agricultural products with the desired quality characteristics (Sexton & Xia, 2018).

Three well-known ways of quality assurance in the food sector are: Good Agricultural Practice (GAP), Hazard Analysis and Critical Control Points (HACCP) and the International Standardization Organization (ISO). More and more in the standardization process certain retail systems stand out, which include certain requirements for all key participants in the product distribution chain. Examples of these certification systems are the British Retail Consortium (BRC), European Retail Good Agricultural Practice (EUREPGAP, or GLOBAL G.A.P.) and Safe Quality Food (SQF) (Trienekens & Zuurbier, 2008). There are also so-called industry standards such as GFSI (Global Food Safety Initiative). GFSI consists of large market chains, such as Carrefour, Sainsbury's, Wal-Mart, Tesco, and etc., which aim to

increase quality and safety. This is very important to point out that IFS, SQF, BRC, HACCP, FSSC 22000 - consists of ISO 22000 and Food Safety Management Systems, etc. (Kotsanopoulos & Arvanitoyannis, 2017).

A business entity can benefit from QMS (Quality Management System) (Aggelogiannopoulos et al., 2007). Research on MQS (Minimum Quality Standards) shows that the imposition of a minimum product standard affects prices, quantities and types of products delivered, as well as the welfare of stakeholders. At the same time, the standards also affect the competition. The expected competitive advantage is an important reason for companies to accept more rigorous standards (Hammoudi et al., 2009). The QMS implementation is a way to improve product quality and strengthen competitiveness and exports. Implementation of the requirements of the ISO standard is an obligation for obtaining a QMS. Since 2007, the Republic of Serbia has implemented various standards (Djekic et al., 2013), as a measure of product quality to improve export competitiveness.

Food safety standards have become an increasingly important issue in global agri-food trade. Food safety standards particularly affect the ability of developing countries to gain access to agri-food markets in developed countries (Henson & Jaffee, 2008). The agricultural sector in developing countries should be included in the quality system, in order to fully ensure the quality of primary and processed products. The application of modern production technologies is very important for improving the quality, yield and business results of the agricultural sector (Jongwanich, 2009). Developing countries must adapt their production processes and products to the standards for food safety and quality in developed countries (Jouanjean, 2012). As a result of this and with the aim of increasing productivity and product quality, the transfer of technology from high-income economies to low-income economies is increasing (Goldberg & Pavcnik, 2007; Swinnen, 2007). Development policies aimed at increasing the competitiveness of agrarians, through innovations, simultaneously raise the issue of improving the quality of agricultural and food products (Curzi et al., 2014).

Unlike conventional agriculture, which emphasizes total yields, sustainable agriculture is based on quality and is environmentally acceptable (Lyson, 2002). There are more and more initiatives to direct agri-food systems towards sustainable development (Coteur et al., 2019). Some authors view sustainable agriculture in relation to food quality and environmental protection, while others focus on the ability of agriculture to maintain long-term productivity. At the same time, almost all authors agree on the importance of three components of sustainable agriculture: ecological, economic and social (Lichtfouse et al., 2009).

Improving product quality and yield, while reducing operating costs and reducing environmental pollution, is an essential goal of precision agriculture (Chlingaryan et al., 2018). The use of computers, infrared spectroscopy, magnetic resonance spectroscopy, X-ray, are just some of the techniques that it is believed can be used to identify and solve the challenges of monitoring agricultural production and analyzing food quality (Patrício & Rieder, 2018).

The agri-food sector of the Republic of Serbia realizes a positive and significant net export. It has a high share in total exports, employment and gross value added (Marković & Marjanović, 2021). Although Serbia has the biggest comparative advantage in the export of the agri-food products among the Western Balkans, it is necessary to increase the level of competitiveness of these products on the EU market and change the export structure, which is mainly based on products of a lower stage of processing, cereals, fruits and vegetables (Matkovski, 2021). Bearing in mind that the agri-food sector is a significant part of the exports of the Republic of Serbia, it is very important to analyse its

competitiveness. The EU is the most important foreign trade partner of the Republic of Serbia, both in terms of total exports and exports of agri-food products. Regarding the type of competition, quality competition is dominant at the EU market. Only vegetables and fruits from Serbia stand out for their quality on the EU market. That is why we should work on improving the quality of the products (Marković et al., 2019). The European Commission proposes that the CAP in the period 2021-2027 focuses on the goals of sustainable development of agriculture, by increasing the competitiveness of agriculture while taking care of the environment, health and food quality (European Commission, 2021). Agricultural production has a positive impact on economic development of the EU countries (Mladenović & Mladenović, 2023). Given that agriculture is a very important sector of the Republic of Serbia in the process of European integration, it is important to follow EU goals in the field of sustainable agricultural development (Zecevic et al., 2019) and to harmonize agricultural policy according to the CAP.

2. METHODOLOGY AND DATA

In order to improve the export structure of agricultural products of the Republic of Serbia, it is necessary to improve the quality of their production and apply new production technologies. Among the most important indicators in the analysis of foreign trade, but also internal competitiveness of exports, are the unit values (UV) of exports and imports (Marković & Marjanović, 2021). High-quality food is reflected in paying higher unit values for safety and quality food (Huang & Gale, 2009), so the UV index, as a direct measure of quality, was used as a measure of quality and necessary component of export improvement (McKelvey, 2011). UV indexes were and are used as a measure of the quality and for impact of certain products on the export (Fast et al., 2022). Fischer (2010) established a link between product quality (as indicated by UV) and export performance, as well as the competitiveness of the entire agribusiness sector. Aiginger (1997) determined that UV index, in addition to being used as a measure of the competitiveness and productivity of the economy, can also be compared with the concept of price and costs, i.e. product quality, depending on specific circumstances. One of its advantages is that information is available for all countries and for most products on nominal exports and imports, so analyses can be conducted for bilateral trade. UV (unit values) index is proposed as price proxies and measure of product quality, which is obtained by dividing the export value by the exported product quantities (Fischer, 2010):

$$UV^{k}_{ct} = \text{Export value}_{ct} / \text{Exported quantity}_{ct}, \quad (1)$$

where k represents the country, c the product and t the year.

Since UV (unit values) refers to homogeneous and comparable goods, the value may indicate differences in quality, assuming that unit costs of production are equal in all considered countries. However, it is difficult to determine with absolute precision and certainty whether high UV (unit values) index reflects high quality or high total production costs (Fischer, 2010).

However, activities with the different signs between the quantity balance and unit values revealed that the cost side dominates ($UV_{exp} < UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$ and vice versa), but if the same signs are between the unit values and the export quantities it is about the quality-

dominated markets" ($UV_{exp} > UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$ and vice versa), that is, demand is determined by quality (Aiginger, 1997, p. 576).

Due to the importance of product quality for increasing the export of the agri-food sector, the importance of quality of the most important export agri-food products on the most important export markets of the Republic of Serbia will be examined. The variables used for the research are shown in Table 1.

Table 1 Definition of variables relevant to the quality of agri-food products of the Republic of Serbia

Label	Definition
Dependent variables	
Exp	Total export (all products)
Exp_EU (28)	Export to the European Union
Exp_Ger	Export to Germany
Exp_Ita	Export to Italy
Exp_B&H	Export to Bosnia and Herzegovina
Agricultural independent variables	
UV_cor	Unit value - corn, in grain (excluding seed for sowing) – (6 digits - 100590)
UV_fro_fru	Unit value - frozen raspberry, blackberry and other fruits (6 digits - 081120)
UV_app	Unit value - apples, fresh (6 digits 080810)
Other independent variables	
Cov_{val}_ cor	Value coverage of imports by exports (export/import*100 - in US$) - corn, in grain (excluding seeds for sowing) - (6 digits - 100590)
Cov_{val}_ fro_fru	Value coverage of imports by exports (export/import*100 - in US$) - frozen raspberry, blackberry and other fruits - (6 digits - 081120)
Cov_{val}_ app	Value coverage of imports by exports (export/import*100 - in US$) - apples, fresh - (6 digits 080810)
Cov_{q}_ cor	Quantitative coverage of imports by exports (export/import*100 - in t) - corn, in grain (excluding seeds for sowing) - (6 digits - 100590)
Cov_{q}_ fro_fru	Quantitative coverage of imports by exports (export/import*100 - in t) - frozen raspberries, blackberries and other fruits - (6 digits - 081120)
Cov_{q}_ app	Quantitative coverage of imports by exports (export/import*100 in t) - apples, fresh - (6 digits 080810)

Source: Authors' research, based on ITC - Trade Map, 2020

Multiple regression will be used to examine the impact of quality of the most important export agricultural products on the total export of the Republic of Serbia, as well as on the export markets of the most important foreign trade partners for agri-food products export of the Republic of Serbia, which is Germany, Italy and Bosnia & Herzegovina, next to the EU in total (ITC - Trade Map, 2020):

$$Exp_{,t} = \alpha + \beta_1 UV\_cor_{i,t} + \beta_2 UV\_fro\_fru_{i,t} + \beta_3 UV\_app_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$Exp\_EU_{,t} = \alpha + \beta_1 UV\_cor_{i,t} + \beta_2 UV\_fro\_fru_{i,t} + \beta_3 UV\_app_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$Exp\_Ger_{,t} = \alpha + \beta_1 UV\_cor_{i,t} + \beta_2 UV\_fro\_fru_{i,t} + \beta_3 UV\_app_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$Exp\_Ita_{,t} = \alpha + \beta_1 UV\_cor_{i,t} + \beta_2 UV\_fro\_fru_{i,t} + \beta_3 UV\_app_{i,t} + \varepsilon_{i,t} \quad (5)$$

$$Exp\_B\&H_{,t} = \alpha + \beta_1 UV\_cor_{i,t} + \beta_2 UV\_fro\_fru_{i,t} + \beta_3 UV\_app_{i,t} + \varepsilon_{i,t} \quad (6)$$

3. RESEARCH RESULTS

In addition to the most important countries to which the Republic of Serbia exports its products (Table 2), it is also important to observe the most important export agri-food products (Table 3), namely corn in the grain, fresh apples, frozen fruit (raspberries, blackberries, currants, etc.), of which in the frozen fruit, raspberry without sugar is the most important for export (SORS, 2020). Corn belongs to the cereal sector (10), and this sector is the most important agricultural export sector, followed by sector 08 (edible fruits and nuts), where frozen fruit dominates exports, followed by fresh apples (ITC - Trade Map, 2020).

Table 2 The most important export countries of the Republic of Serbia from 2006-2019, in 000$

Year	Total export	Export to EU	Export to Germany	Export to Italy	Export to B&H
2006	6427892	3866960	636960	926047	748963
2007	8824701	5265746	937491	1094269	1042136
2008	10972082	6387373	1141357	1128468	1338745
2009	8345076	4756364	870475	821336	1015613
2010	9794516	5921885	1008213	1118513	1088979
2011	11779478	7259129	1330706	1306232	1191424
2012	11229031	6894109	1308601	1203874	1074727
2013	14610779	9165483	1734413	2379430	1201516
2014	14843348	9593047	1773186	2576939	1318985
2015	13361043	8774981	1668614	2158893	1170981
2016	14832645	9810516	1936277	2162009	1227520
2017	16946130	11210678	2132600	2247489	1353975
2018	19157001	12861241	2296753	2351729	1510293
2019	19557555	13059158	2477551	1979512	1495549

Source: ITC - Trade Map, 2020

The following Table 3 shows the most important agri-food export sectors, as well as the most important agri-food export products within them.

Corn, in the observed period of 2006-2019, is the dominant export product in the cereal sector, with a large share, even more than half of the total export of cereals in most years (except in 2007, 2013 and 2018), but when it comes to edible fruit, the export is dominated by frozen fruit. However, that share has been decreasing in recent years compared to the earlier period, while it is increasing in the case of apples (Table 3).

Table 3 The most important sectors and products in the agricultural exports of the Republic of Serbia

Year	10 – Cereals			08 - Edible fruits				
	Total cereals export	Corn	Share of corn in cereals exports	Total edible fruits export	Frozen fruits	Apples	Frozen fruits	Apples
	000 $		%	000$			Share in edible fruits export, %	
2006	191484	173484	90.60	196892	123957	11691	62.96	5.94
2007	172946	69199	40.01	303659	170481	23810	56.14	7.84
2008	151521	96490	63.68	335670	204230	14611	60.84	4.35
2009	327146	261231	79.85	321471	206831	14964	64.34	4.65
2010	429022	312013	72.73	356496	187834	46419	52.69	13.02
2011	557065	432125	77.57	446996	209995	65799	46.98	14.72
2012	667911	532966	79.80	370589	180188	41480	48.62	11.19
2013	486789	159591	32.78	478612	231794	53025	48.43	11.08
2014	605084	448920	74.19	552999	277365	81307	50.16	14.70
2015	485085	333615	68.77	582589	308811	104177	53.01	17.88
2016	513302	336650	65.59	606487	278455	127633	45.91	21.04
2017	387355	268552	69.33	660454	265165	125751	40.15	19.04
2018	462672	214585	46.38	583908	260272	100512	44.57	17.21
2019	591458	486607	82.27	608076	271306	118559	44.62	19.50

Source: Authors' research, based on ITC - Trade Map, 2020

There are activities where the UV indicates costs and those where it indicates quality. If the low UV of exports leads to a higher amount of exports compared to the amount of imports ($UV_{exp} < UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$ and vice versa), the cost side is dominant, because the theory indicates that most goods are price elastic. If a high UV leads to a higher amount of exports compared to the amount of imports ($UV_{exp} > UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$ and vice versa), the quality is dominant, because theory indicates that prices can be higher if we concentrate on quality. Given that the low unit value of exports leads to a greater amount of exports compared to the amount of imports ($UV_{exp} < UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$), it is concluded that corn dominates not in the quality, but in the cost side. In contrast to corn, the situation is the opposite with frozen fruits and apples, i.e. a high unit value leads to a higher amount of exports compared to the amount of imports ($UV_{exp} > UV_{imp} \Rightarrow Q_{exp} > Q_{imp}$), which means that demand is determined by quality (Table 4). The highest unit values of fruit exports are realized on the most important export market of Serbia, that is, the EU market. According to the UV, the fruit sector achieves a high competitiveness,

which should be an incentive for the production and export of fruit products in order to improve the structure of the overall export, especially when it comes to processed products (Marković & Marjanović, 2021). Besides, Serbia can be said to be a significant corn producer. But anyway agricultural production must be adapted to new conditions in order to improve quantity and quality of the corn production and export (Ilić et al., 2016).

Table 4 The quality of the most important export agricultural products of the Republic of Serbia (UV - unit values index as a measure of product quality with accompanying indicators)

Corn				Frozen fruits				Apples			
UV_{exp}	UV_{imp}	Q_{exp}	Q_{imp}	UV_{exp}	UV_{imp}	Q_{exp}	Q_{imp}	UV_{exp}	UV_{imp}	Q_{exp}	Q_{imp}
129	390	1345995	59	1506	1340	82321	1255	315	238	37140	12112
170	331	406270	148	2182	2408	78143	1435	321	305	74189	21387
180	159	537363	383	3315	2935	61601	1896	415	427	35206	16914
164	529	1591060	747	2799	2524	73884	1804	375	349	39957	12797
189	353	1653356	249	2140	2377	87765	1958	434	242	107007	29346
266	696	1621646	296	2093	1899	100331	2202	505	357	130182	32254
252	879	2118964	819	2113	1919	85286	4584	673	341	61642	47471
205	662	779290	2787	2894	2319	80108	5717	457	363	115938	28753
189	829	2372557	1464	2902	2467	95564	6201	598	333	135982	23418
160	1198	2090024	252	2558	2328	120705	7481	556	297	187366	58759
164	470	2056478	164	2569	2253	108382	6652	550	304	232223	75851
169	569	1587367	260	2145	1703	123599	13425	637	319	197406	65730
180	238	1195193	5832	1930	1598	134857	13099	694	344	144760	35727
163	207	2990355	1081	1831	1620	148184	12833	546	256	217001	33171

Source: Authors' research, based on ITC - Trade Map, 2020

Table 5 Determining quality, based on UVexp vs. UVimp (UV index for export vs. UV index for import) and Covval vs. Covq (coverage of imports by exports in value vs. coverage of imports by exports in quantity)

Average values for the period 2006-2019	Corn	Frozen fruits	Apples
Cov_{val}	197545.50	3037.38	593.11
Cov_{q}	540051.63	2824.2	360.05
The difference in %	**-173.88**	**+7.55**	**+64.73**
UV_{exp}	184.29	2355.5	505.43
UV_{imp}	536.43	2120.72	319.64
The difference in %	**-191.09**	**+11.07**	**+58.12**

Source: Authors' research, based on ITC - Trade Map, 2020

Based on the Table 5, it can be seen that in the case of corn, where the emphasis is not on quality and where the import price is higher than the export price, the coverage of import by export expressed in terms of value is lower than the coverage of import by export expressed in quantities, while in the case of products where the emphasis is on

quality (frozen fruits and apples) and export prices are higher than import prices, and the coverage of imports by exports expressed in terms of value is higher than the coverage of imports by exports expressed in quantities.

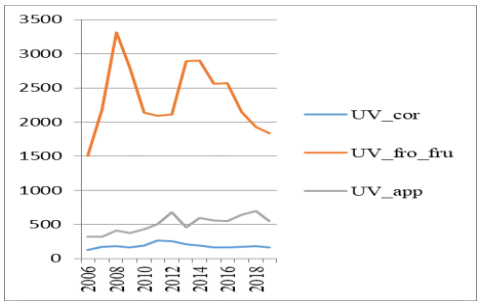

Fig. 2 Differences between UVexp
Source: Authors' research, based on ITC - Trade Map, 2020

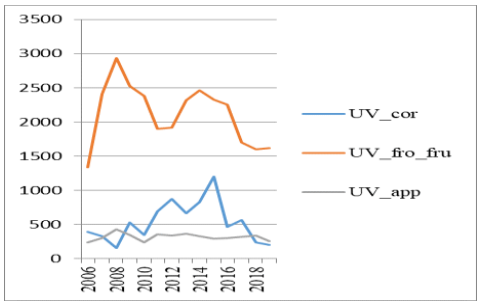

Fig. 3 Differences between UVimp
Source: Authors' research, based on ITC - Trade Map, 2020

Among the observed agricultural products, frozen fruit has the highest export and import prices, followed by apples, and corn has the lowest export price, while imported corn had a higher price than apples in the period from 2009-2018 (Fig. 2 & Fig. 3).

Table 6 Multicollinearity of research variables related to the quality of agri-food products of the Republic of Serbia

Label	Exp	Exp_EU (28)	Exp_Ger	Exp_Ita	Exp_B&H	UV_cor	UV_fro_fru	UV_app
Exp	1.00							
Exp_EU (28)	***0.99	1.00						
Exp_Ger	***0.99	***0.99	1.00					
Exp_Ita	***0.84	***0.85	***0.86	1.00				
Exp_B&H	***0.90	***0.88	***0.87	***0.68	1.00			
UV_cor	0.03	0.01	0.01	-0.05	0.12	1.00		
UV_fro_fru	-0.03	-0.08	-0.05	0.16	0.20	0.08	1.00	
UV_app	***0.76	***0.76	***0.76	***0.67	***0.66	0.36	-0.08	1.00

Source: Authors' research, based on ITC - Trade Map, 2020
Note: *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively

Since the independent variables, measures of product quality, are not in multicollinearity (Table 6), they can be used in the same regression equations together.

Table 7 Impact of the quality of the most important export agricultural products on the export of the Republic of Serbia

Label	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent variables	Exp	Exp_EU (28)	Exp_Ger	Exp_Ita	Exp_B&H
Intercept	3398256.97 (0.62)	2241362.22 (0.58)	262931.07 (0.34)	-34763.21 (-0.04)	*495715.76 (-1.52)
UV_cor	*-30823.40 (-1.39)	*-25619.33 (-1.63)	*-4968.78 (-1.62)	-6389.89 (-1.71)	-923.08 (-0.70)
UV_fro_fru	450.11 (0.30)	87.36 (0.08)	49.66 (0.24)	324.01 (1.27)	110.42 (1.23)
UV_app	***27951.76 (4.28)	***20727.07 (4.50)	***4063.60 (4.51)	4203.31 (3.83)	***1212.49 (3.15)
Adjusted R^2	0.54	0.57	0.57	0.49	0.38
F-statistic	***6.14	***6.82	***6.81	**5.15	**3.67

Source: Authors' research, based on ITC - Trade Map, 2020

Note: beta coefficients in front of parentheses, t-values in parentheses;

*, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively

All tested models (Table 7) are statistically significant. It can be seen that the quality of corn has a statistically negative impact in the first three models. Regarding the impact of the quality of frozen fruit and apples on the most important export markets, as well as the total export, a positive impact of the quality of these products can be observed, with the fact that in the case of apples this impact is statistically significant (except the fourth one). The conclusion is that the quality of agricultural products is reflected in the competitiveness and export of the Republic of Serbia.

4. DISCUSSION

It is important for the Republic of Serbia to focus on products that are competitive on foreign markets based on quality (fruit), with support for the association of producers in clusters, through vertical and horizontal coordination, in order to achieve a higher export price. Nevertheless, attention should also be paid to cereals, first of all corn, considering its strategic position, that is, its dominant position in exports. It is important to reduce the costs of corn production, by increasing productivity, as well as to improve the quality of this product, through better quality seeds that should be used during sowing and later by applying more efficient agrotechnical measures in its production. The role of the government is also very important here, because the government must participate more significantly in the agricultural policy with incentive measures. Also, one should take into account the prices of imported products that are imported at higher prices compared to exported ones.

By processing primary agricultural products, Serbia can increase the value added and export of those products. Increasing productivity and efficiency in production, applying knowledge, technologies and experiences can lead to the improvement of product quality and strengthening competitiveness. Competitiveness is the basis for success and survival at the local level, and especially on the international market. Competition encourages production of high quality agricultural products and reduction of costs compared to competitors. The factors

of competitiveness are numerous, and emphasis is increasingly placed on the quality of products and services, quality standards, product safety and environmental protection.

Product quality and the introduction of the green economy have a positive impact on competitiveness and environmental protection (Bejtović et al., 2022). In order to produce better quality products, manufacturers need to develop new products and new technologies, in order to obtain high quality final products. High quality is already achieved by exporting frozen raspberries and other fruits from Serbia; however, it is necessary to achieve a higher level of fruit processing, in order to increase profits, etc. Also, it is necessary to encourage the development of livestock, in order to develop a wider range of quality meat and meat products, especially products with a geographical origin label, which enable a significant increase in exports. Agricultural production in Serbia is still not sufficiently focused on the optimal use of available capacities, increasing production, as well as changes of production structure towards finalization and high-quality products. The slowing down of technological restructuring, the growth of productivity and efficiency in agriculture is conditioned by the lack of new knowledge and technologies. With new technology and knowledge, it is possible to use resources more rationally and increase product quality and productivity, and therefore competitiveness on the market (Milojević et al., 2011).

In the fruit production of the Republic of Serbia, the most important fruit species are plums, apples and cherries, both in terms of the number of bearing trees and the production achieved, but raspberries are also very important. In the Republic of Serbia, due to favorable climatic and soil conditions, there is potential for the development and further improvement of fruit production, especially on family farms. Fruit farming, as an important field of plant production, is based on a number of comparative advantages in relation to other branches of agriculture, so that is why more attention should be paid to the production of fresh and processed fruit. Also, the adoption of quality standards is important for future progress in fruit production, as well as permanent support of the government, through incentives and integration within cooperatives and associations of fruit growers (Milić et al., 2011). The full potential of agriculture and fruit production has not yet been realized, although Serbia has favorable natural conditions for growing many fruit species. The largest volume of production of processed fruit products mainly refers to fruit juices and frozen fruit. Fruit juices and frozen fruit make over 90% of total processed fruit products. The fruit processing and cooling industry in the Republic of Serbia is often faced with the problem of insufficient capacity utilization. The volume of processing capacity is not always accompanied by the appropriate volume, quality and assortment of raw materials from agriculture (Lukač Bulatović et al., 2013).

The label "Serbian quality" is a national label used to mark agricultural and food products with special properties in the Republic of Serbia, with the aim of promoting higher product quality and the domestic origin of raw materials. The mark is a guarantee for consumers to buy a product of proven higher quality, which is produced from raw materials exclusively from the territory of the Republic of Serbia and which has specific characteristics that distinguish it from other products from the same food category (Ministry of Agriculture, Forestry and Water Management, 2020). The geographical origin (Table 8) is of particular importance when it comes to agricultural and food products.

Table 8 Geographical origin agri-food products, in 2020

No	Product with geographical indication	Type of label	Name of association/producer
1	Aril raspberry	Name of origin	Association "ARILL RASPBERRY ", Arilje
2	Djerdap honey	Geographical indication	Beekeeping Society "GOLUBAC'S CITY", Golubac
3	Homemade ajvar from Leskovac	Name of origin	Association "LESKOVAC'S AJVAR", Leskovac
4	Oblacinka from Oblacina	Name of origin	Association "OBLACIN'S CHERRY", Merosina
5	Pirot cheese made from cow's milk	Name of origin	Dairy School "Dr. Obren Pejic", Pirot
6	Kulen of Srem	Name of origin	"BUT&CO", Lacarak, Sremska Mitrovica
7	Fruskogorsk lime honey	Name of origin	Association of beekeepers "JOVAN ZIVANOVIC", Novi Sad
8	Futo fresh and sauerkraut	Name of origin	Association of producers and processors of futo cabbage " FUTO CABBAGE ", Futog
9	Homolj honey	Name of origin	Beekeeping cooperative "HOMOLJE MED", Žagubica

Source: Ministry of Agriculture, Forestry and Water Management, 2020

The concept of traditional and geographically indicated agricultural products is gaining importance due to the increasing desire of consumers to consume quality food (Užar, 2022). Also, consumers' decision depends on product and brand quality (Rita Inoni & Okorie, 2022). Bearing in mind the above, as well as a series of earlier research on the quality of agricultural and food products, it can be concluded that the Republic of Serbia should focus significantly more on quality agricultural products with protected geographical origin, which makes them recognizable on the world market, especially on the market of the most important agri-food foreign trade partners, such as the EU as a whole, in particular Germany and Italy, both the EU members, as the most important foreign trade countries for agri-food export from Serbia, as well as the country in the region (Bosnia & Herzegovina).

Further development of the agri-food sector will depend on the possibility of increasing its competitiveness, especially the requirements for food quality and safety (Matkovski et al., 2017). The space for competitiveness growth is found in significant natural resources that are still underutilized in agriculture, in the sphere of improving product quality standards, improving product assortment, introducing new types of production and innovations in the agri-food sector (Cvetković et al., 2017), that are very important for increasing competitiveness and achieving sustainable development (Cvetanović et al., 2016).

CONCLUSION

The Republic of Serbia has high-quality agricultural products, recognizable on the international market, such as frozen fruit and apples, the quality of which has a positive impact on the exports of the Republic of Serbia to the most important export markets. On the other hand, although it does not stand out especially for the quality of corn, which

statistically has a negative impact on the exports, the cereals sector and corn within that sector are strategically very important, especially since corn is exported in almost the biggest quantities of all agricultural products. However, the product quality, on the basis of which frozen fruit and apples are competitive at the world level, as well as the low price, on the basis of which corn achieves competitiveness, are not sufficient for that competitiveness to be achieved in the long-term. It is also necessary to innovate processing capacities, as well as to create a high-quality final product with value-added. Also, it is important to organize production and join together in clusters, in order to achieve greater bargaining power, as well as chances for financing.

The Republic of Serbia, from the aspect of agriculture, must encourage the maintenance and growth of competitiveness in the markets of the EU, which is the most important foreign trade partner for agri-food products, but also in the markets of other countries, which are also among the most important trading partners of the Republic of Serbia for agri-food products, i.e. in addition to the EU and the countries from the region, such as Bosnia and Herzegovina.

In addition to improving the quality of agricultural products, it is important to innovate the production process itself, as well as to process primary agricultural products into products of higher stages of processing, which can influence the increase in competitiveness and exports. This proved the hypothesis that the high quality agricultural products have positive impact on the export markets of the most important trade partners of the Republic of Serbia. Therefore, improving the quality of agricultural products has a positive impact on the growth of exports and the competitiveness of the agri-food sector.

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KVALITET POLJOPRIVREDNO-PREHRAMBENIH PROIZVODA KAO DETERMINANTA KONKURENTNOSTI IZVOZA REPUBLIKE SRBIJE

Kvalitet i bezbednost proizvoda predstavljaju bitne determinante konkurentnosti izvoza zemlje. Pitanja kvaliteta poljoprivredno-prehrambenih proizvoda sve više dobijaju na značaju, imajući u vidu savremene izazove i potrebe potrošača. Ovo pitanje je od posebnog značaja za zemlje u razvoju, pa i samu Republiku Srbiju, imajući u vidu značaj ovog sektora za izvoz i celokupni privredni razvoj. S druge strane, upravo su ove zemlje u zaostatku za razvijenim zemljama po standardima kvaliteta, s obzirom na skupe postupke sertifikacije i standrdizacije kvaliteta. Shodno tome, rast konkurentnosti treba postići kroz poboljšanje standarda kvaliteta proizvoda, unapređenje asortimana proizvoda i brži prodor inovacija u poljoprivredno-prehrambeni sektor. Cilj istraživanja je da se ispita kvalitet najznačajnijih izvoznih poljoprivredno-prehrambenih proizvoda Republike Srbije. Kao mera kvaliteta proizvoda, indeks

jedinične vrednosti (UV), je korišćen za analizu kvaliteta najvažnijih poljoprivredno-prehrambenih proizvoda na najvažnijim izvoznim tržištima, a na osnovu sekundarnih ITC podataka. Višestrukom regresijom je utvrđeno da poboljšanje kvaliteta ovih proizvoda ima pozitivan uticaj na rast izvoza i konkurentnosti poljoprivredno-prehrambenog sektora Republike Srbije. Naime, konkurentnost poljoprivredno-prehrambenog sektora zavisiće, pre svega, od sposobnosti ovog sektora da odgovori na zahteve povezane sa standardima bezbednosti i kvaliteta hrane, kao i mogućnosti ulaganja i inoviranja prerađivačkih kapaciteta, kako bi se stvorio kvalitetan finalni proizvod sa visokom dodatom vrednošću.

Ključne reči: *kvalitet, UV indeks (indeks jediničnih vrednosti), konkurentnost, izvoz, poljoprivredno-prehrambeni sektor*