

## **CHALLENGES AT COMPETITIVE AND SUSTAINABLE DEVELOPMENT OF THE VINE AND WINE SECTOR AND THE PRODUCTION OF BEER IN BULGARIA**

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### **Abstract**

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The importance of this study is to determine the competitiveness and sustainability of the vine and wine sector and the production of beer in Bulgaria after the accession to the EU. Development of wine viticulture is determined by the demand of wine on the global market and the traditional demand of local wines on the national market. This requires complete market researches about demand of wines, varietal structure of vineyards, cultivated area and applied technologies of production. In the article in order to assess the place of Bulgarian vine and wine sector and production of beer in the structure of world trade with such goods is used Balassa index with its three varieties – RCA1, 2, 3.

The main conclusions from this study are that vine and wine sector in the period of Bulgaria's membership in the EU is unsustainable and with declining competitiveness in domestic and external market while the production of beer in Bulgaria after the country's accession to the EU is stable and competitive. The production of barley increases over 15% and the domestically produced beer is about 90% of consumption of beer in the country.

*Key words:* competitiveness; sustainability; vine; wine; beer; Balassa index; Bulgaria

### **Introduction**

The aim of the article is to evaluate the competitiveness and sustainability of the vine and wine sector and the production of beer in Bulgaria on the basis of current European regulations. Viticulture in Bulgaria is a traditional agricultural sector of the country, which is export-oriented and highly dependent from trends in global wine trade. This complicates the management of the sector and characterizes it as a risky production. Development of wine viticulture is determined by the demand of wine on the global market and the traditional demand of local wines on the national market. This requires complete market researches about demand of wines, varietal structure of vineyards, cultivated area and applied technologies of production (Toteva, 2015).

Beer in Bulgaria appears as a beverage in the country in the second half of the nineteenth century, when it begins to

produce from foreign-brewers from Austria-Hungary, France and Switzerland. Today Bulgaria is at 25<sup>th</sup> place in the world in beer consumption per capita of 72 liters per year.

### **Materials and Methods**

In economic literature, one of the most common methodological approach for determining competitiveness is by considering the cost of production; certain market share and direct investment in production. To my opinion each agricultural sector is sustainable if it is economically efficient; socially responsible regarding producers, workers, consumers and society and ecologically sustainable. To evaluate the competitiveness and sustainability of the vine and wine sector and the production of beer in Bulgaria I preferred to use Balassa index with its three varieties – RCA1, 2, 3 and market researches about demand of wines, varietal structure

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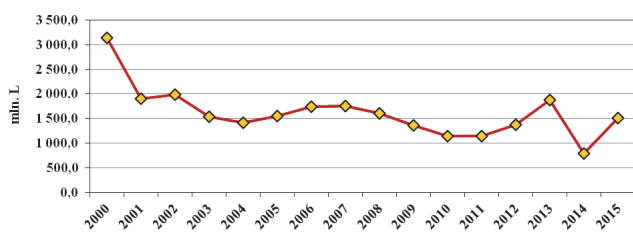
of vineyards, cultivated area and applied technologies of production.

## Results and Discussion

The harvested areas with wine vineyards from 97 021 ha in 2000 year reduce to 36 458 ha in 2015 year. Much more serious is the reduction of harvested areas with table wine vineyards – from 14 186 ha in 2000 year to only 2 254 ha in 2015 year.

The production of wine grapes from 376 903 tons in 2000 year is decreased to 244 357 tons in 2015 year, while the production of table grapes from 49 443 tons in 2000 year is reduced to only 16 320 tons in 2015 year.

The reasons for this significant reduction of wine grapes and table grapes in Bulgaria can be searched in the transition from centrally planned to market economy as well as in the position of Bulgarian wines in international markets after Bulgaria's accession to the European Union. In these years, large areas of vineyards were abandoned and there were not investments in order to create new vineyards (Pantaleeva, 2010). The opening of the Bulgarian economy after Bulgaria's accession to the European Union puts it in a strong competition conditions in both domestic and international market. Before Bulgaria's accession to the European Union and before the start of reform in vine and wine sector in the country is produced, for example in 2000 year – 3143.7 mln. liters of wine. In 2015 the production of wine decreases to 1 510.9 mln. liters (Figure 1).



**Fig. 1. Wine production in Bulgaria**

Source: EAVW, 2000-2016

The problems that appear in Bulgarian wine production over the last fifteen years are the result of reduced consumption of Bulgarian wines on the domestic market, higher prices and increased competition in Bulgaria from countries where the wine sector is strongly supported by the state.

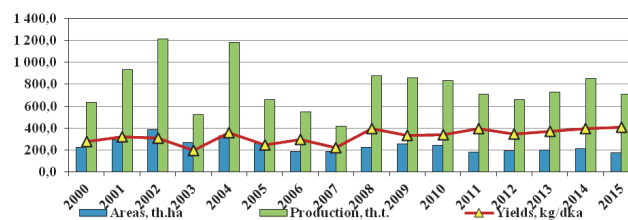
Typical for the production of beer are the specific materials from which it is produced. These are water, malt, hops and yeast. Each of these materials has a typical feature that combined with the other raw materials during the

production process formed the character of the different types of beer.

Brewing technology basically is based on the action of various enzymes formed during the malt production and subsequently degrading most of the substances which malt consist. Malting barley is the main feedstock for the production of malt. Through to a number of technology processes, barley alters its structure and features and turns into brewing malt, which can be put as a raw material for the production of beer.

Because of its great adaptability to different climatic and soil conditions, barley is one of the most common grains and it is grown in many regions of the world, much of it is used precisely in malt and brewery industry. Regarding the production of this crop culture in Bulgaria, according to Ministry of Agriculture and Food in 2015 year about half of the production is malting barley and the other half – feed barley.

Production of barley in Bulgaria is decreasing in 2015 year over 16% compared to 2014 year (Figure 2). The harvest in 2015 year is 711.56 hil.t. This is due to a reduction in the harvested area (about 18%). According to the main quality indicator – the protein content in barley, about half of the production is malting barley and another half – feed barley.

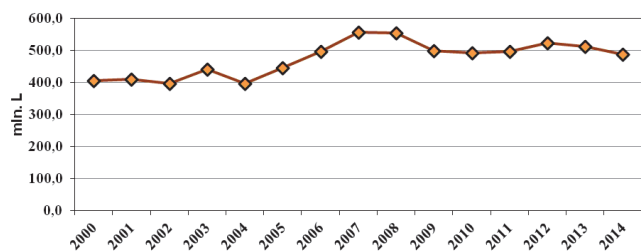


**Fig. 2. Areas, yields and production of barley in Bulgaria**

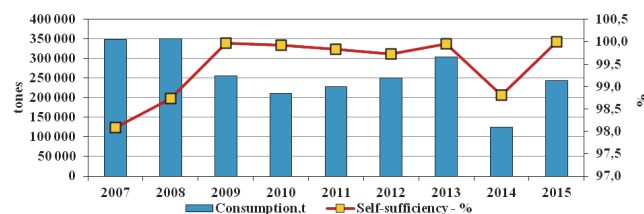
Source: MAF, Agro-statistics, 2001-2016

The produced beer in the country (Figure 3) ranks first among the taste preferences of Bulgarians, despite increasing imports from EU and third countries. According to the trade organization of brewers around 90% of consumption of beer is produced by companies that are members of the Union of Brewers in Bulgaria. This is undeniable proof that Bulgarian consumers continues to evaluate high quality of produced in the country beer, although in 2015 year Bulgaria imported 466 000 hectoliters of beer, 9% more than the previous year.

After the accession of Bulgaria to the EU consumption of wine grapes is reduced double in 2015 compared to 2007 (Figure 4). In these years Bulgaria supplies its needs from wine grapes around 98%.

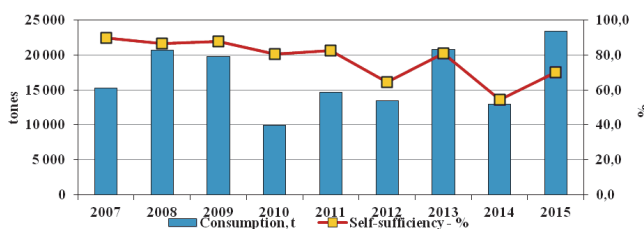


**Fig. 3. Production of beer in Bulgaria**  
Source: NSI, Statistical Yearbook, 2001-2015



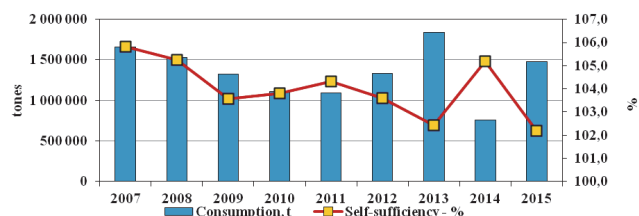
**Fig. 4. Consumption of wine grapes in Bulgaria and the degree of satisfaction of needs**  
Source: Eurostat, 2008-2016, and calculation of author

Consumption of table grapes in Bulgaria increased from 15 245 tons in 2007 to 23 329 tons in 2015. The degree of satisfaction of needs from table grapes reduces from 89.5% in 2007 to 70.0% in 2015. The reason is that table grapes ripen at a time when there are plenty of other fruits in the domestic market as well as there are imported fruits with lower prices than Bulgarians (Figure 5).



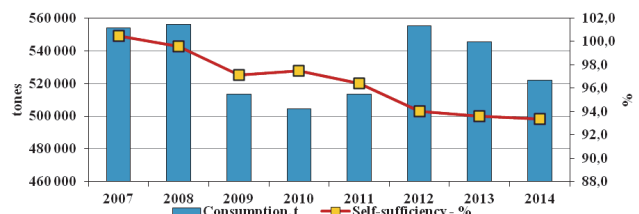
**Fig. 5. Consumption of table grapes in Bulgaria and the degree of satisfaction of needs**  
Source: Eurostat, 2008-2016, and calculation of author

Bulgarian wine consumption decreases about 10% in 2015 compared to 2007. The reason is the lower price of imported wines from Italy, Spain, Chile. Bulgaria can fulfill its need from wine to 100% because, there is a good vine and wine base with high quality and tradition in the country (Figure 6).



**Fig. 6. Consumption of Bulgarian wines and the degree of satisfaction of needs**  
Source: Eurostat, 2008-2016, and calculation of author

Bulgarian beer consumption in the country decreased slightly from 553 889 tons in 2007 to 521 844 tons in 2014. The degree of satisfaction of needs from beer slightly reduces from 100% in 2007 to 93.4% in 2014 (Figure 7).

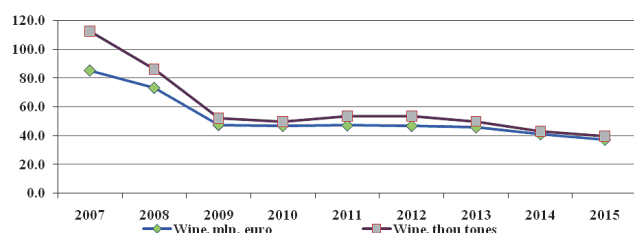


**Fig. 7. Consumption of beer in Bulgaria and the degree of satisfaction of needs**  
Source: Eurostat, 2008-2015, and calculation of author

After Bulgaria's accession to the EU, export of Bulgarian wines is not stable. The increase in export in 2007 was a result of favorable structural changes in the sector, to the greater opportunities to increase production of high quality wines because of the capacity and raw materials and higher growth in export of wine from higher price category which provides larger volumes of foreign exchange earnings to the winemakers. This means that the competitive forces of the wine industry gradually strengthen, but there is a need from joint efforts both from the producers and the state and other institutions to seek opportunities for extended supply of Bulgarian wines in foreign markets.

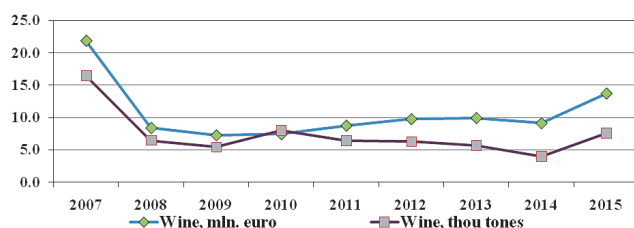
After 2007 crash occurs in export of Bulgarian wine. Stagnation in incomes determines the stagnation in consumption and a recession in export of wine. In 2015, export of Bulgarian wines in quantity and value decreased double compared to 2007 (Figure 8).

After the accession of Bulgaria to the EU in the crisis for the world economy in 2008 there has been a sharp decrease in import of wine in Bulgaria. In 2015, import of wine on the Bulgarian market in volume and value decreased double compared to 2007 (Figure 9). The largest import is observed in the imported bottled wines.



**Fig. 8. Dynamics of export of Bulgarian wine in quantity and value**

Source: Eurostat, 2008-2016, and calculation of author



**Fig. 9. Dynamics of import of wine in the Bulgarian market in volume and value**

Source: Eurostat, 2008-2016, and calculation of author

The average export price of bottled Bulgarian wines from 2008 seeks up and in 2015 reached € 124.6 / tones, which is due to the good performance of Bulgarian bottled wines in foreign markets (Table 1). Data on average export price of wine at exporting countries of the EU over the past few years shows that they are double higher than those who Bulgarian exporters realize.

The prices of imported bottled wines in Bulgaria are higher two or three times than the prices of exported Bulgarian wines. The average price of imported wines from 2008 is growing steadily and in 2015 reached € 137/tones (Table 1). However, the sector is export-oriented and our country has positive external trade balance during the reference period. In recent years, Bulgaria imports wine mainly from Italy, France, Chile, New Zealand.

To assess the place of Bulgarian vine and wine sector and production of beer in the structure of world trade with such goods is used Balassa index through its three varieties – RCA1, 2, 3. RCA1 shows the share of Bulgarian export of

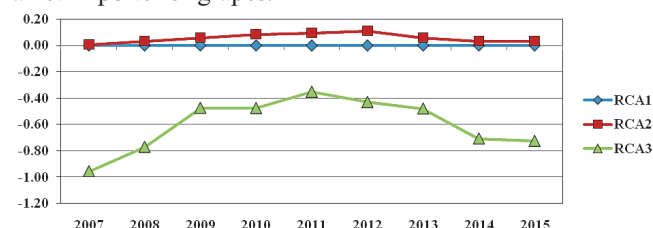
**Table 1**  
**Dynamics of average export and import price of wine 2007 = 100%**

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Wine, export price, euro/tones	100.0	112.2	120.2	124.3	116.5	115.5	121.4	126.4	124.6
Wine, import price, euro/tones	100.0	98.7	101.6	70.4	103.0	118.2	131.9	175.2	137.0

Source: Eurostat, 2008-2016, and calculation of author

grapes, wine and beer in the world’s export of such goods and the index can not exceed 1. RCA2 shows the place of grapes, wine and beer in Bulgarian agricultural export, compared with the world agricultural export and the index can exceed 1. RCA3 shows whether the country is a net importer or net exporter of such goods and the index is in the range -1 to 1.

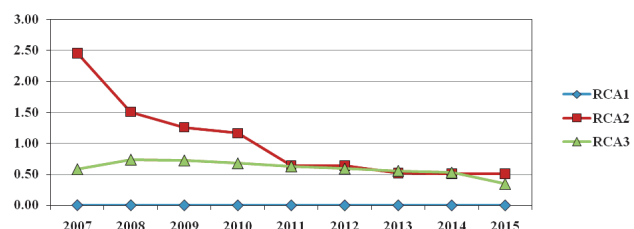
The numbers in Figure 10 clearly show extremely low values and stagnation values of Balassa index such as RCA 3 even have negative values. This indicates that production of grapes has unsustainable development and our country is a net importer of grapes.



**Fig. 10. Balassa index at grapes**

Source: ITC, International Trade Centre, International trade in goods (www.Intracen.org/), Grapes, fresh or dried – 0806 and calculation of author

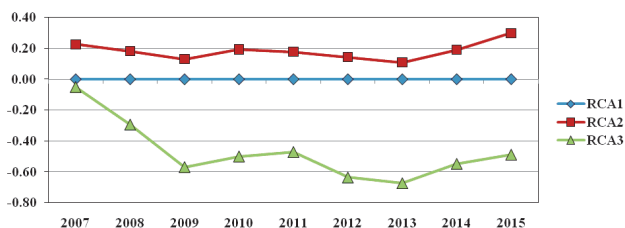
Balassa index at wine shows low and decreasing values of RCA1, which means low share of Bulgarian wine export in the world export. RCA2 tends to decrease – from 2.5 in 2007 to 0.5 in 2015, which shows that in 2007 the wine has a good place in Bulgarian agricultural export compared with the world export, but in 2015 it lost its good positions (Figure 11).



**Fig. 11. Balassa index at wine**

Source: ITC, International Trade Centre, International trade in goods (www.Intracen.org/), Wine of fresh grapes, incl. fortified wines; grape must, partly fermented and of an actual – 2204 and calculation of author

At Figure 12 Balassa index at beer shows low levels of RCA1 and decreasing values of RCA3, such as RCA3 has negative values. This shows the low share of Bulgarian beer export in the world export and higher import of beer in the country.



**Fig. 12. Balassa index at beer**

Source: ITC, International Trade Centre, International trade in goods ([www.Intracen.org/](http://www.Intracen.org/)), Beer made from malt– 2203 and calculation of author

To identify value differences in the average export price and the average import price of wine in Bulgaria and France is used Anova analysis. One of the main advantages of this analysis is that it does not require differentiation of endogenous and exogenous variables such as each variable influenced by others and affects other variables reflecting feedback.

The data in Table 2 shows that in France in the last six years the average export prices of French wine are increasing 5% per year. For a difference from France, Bulgaria exports wine to permanently lower average prices. Over the past six years in Bulgaria is observed slight inflation increase in average export prices of Bulgarian wines.

**Table 2**

**Anova: Two factors without reflection in years**

Years	FR – Export price, €/t	BG – Export price, €/t	FR – Import price, €/t	BG – Import price, €/t
2010	4437.00	943.62	910.89	1318.25
2011	4712.04	886.48	897.87	1726.50
2012	4969.06	874.51	1052.26	1901.18
2013	5112.54	917.01	1210.14	2327.28
2014	5196.69	959.78	939.93	2907.47
2015	5649.78	951.58	916.60	2392.54

Source: Eurostat, 2011-2016, and calculation of author

**Table 3**

**France, the average export price**

Source of variation	SS	df	MS	F	P-value	F crit
Rows	7722338	11	702030.7	18.727384	7.96195E-15	1.967546647
Columns	10481213	5	2096243	55.919404	2.44006E-20	2.382823301
Error	2061777	55	37486.85			
Total	20265328	71				

Source: Eurostat, and calculation of author

The data in Table 3 gives reason to claim that there are reasons for the increase in average export prices of French wines because the value of F is higher than the value of F crit. Some of the reasons may be that France finds new markets and branding its wines. Also the main aim of the French marketing concept is to increase the average export prices of French wines.

In France over the last six years, except in 2012 and 2013, average import prices of wines remain at the same level and are about five times lower than the average export prices of French wines. In Bulgaria over the last six years the average import prices of wines increase, but they are about three times higher than the average export prices of Bulgarian wines (Table 2).

The data in Table 4 gives ground to claim that there are reasons for the low average import prices of wines in France because the value of F is higher than the value of F crit. To some extent this situation can be explained by the policy pursued in France in the vine and wine sector.

The data in Table 5 gives ground to assert that there are no reasons for the higher average import prices of wines in Bulgaria because the value of F is lower than the value of F crit. To some extent after Bulgaria's accession to EU the main instrument for influence on the development of Bulgarian wine viticulture is a National support program. The attached historical approach to the distribution of national financial envelopes accompanying National support programs of viticulture in the EU for Bulgaria did not reflect fully the problems in the sector. The Support for Bulgarian viticulture places Bulgarian manufacturers in the industry at

**Table 4**  
**France, the average import price**

Source of variation	SS	df	MS	F	P-value	F crit
Rows	1061037.1	11	96457.92	13.258421	7.49897E-12	1.967546647
Columns	899438.17	5	179887.6	24.726077	5.8326E-13	2.382823301
Error	400137.07	55	7275.219			
Total	2360612.4	71				

Source: Eurostat, and calculation of author

**Table 5**  
**Bulgaria, the average import price**

Source of variation	SS	df	MS	F	P-value	F crit
Rows	2416785.8	11	219707.8	0.4823659	0.906338998	1.967546647
Columns	18951582	5	3790316	8.3215951	6.56858E-06	2.382823301
Error	25051375	55	455479.5			
Total	46419743	71				

Source: Eurostat, and calculation of author

a disadvantage to producers in other Member States. Now is extremely important for Bulgarian viticulture the development of a New national strategy for development of vine and wine sector in order to have a real effect on expanding of traditional markets for Bulgarian wines and breakthrough in a new attractive destinations.

To identify value differences in the average export price and the average import price of beer in Bulgaria and Germany is used Anova analysis.

The data in Table 6 shows that in Germany and Bulgaria over the last six years the average export prices of beer increased – about 14% in Germany in 2015 compared to 2010 and about 33% in Bulgaria in 2015 compared to 2010. The reasons for this may be searched in increasing consumption of beer in the international market because of the lower price compared to the price of the wines. In Germany over the last six years the average import prices of beer also increased around 14% in 2015 compared to 2010.

Unlike Germany, in Bulgaria over the last six years the average import prices of beer remain at a relatively constant

level. In 2015 compared to 2011 there is an increase about 5% of the average import price of beer in Bulgaria.

In Germany there is no significant difference in average export prices of beer in different months of the year. In Bulgaria during the summer months there is a slight increase in average export prices of Bulgarian beer. The average import prices of beer in both countries during different months of the year remain relatively constant.

The data in Table 7 and Table 8 gives ground to claim that there are no objective reasons for the increase in average export prices of beer in Germany and Bulgaria because the value of F is lower than the value of F crit.

The data in Table 9 gives ground to assert that there are reasons for the slight increase in average import prices of beer in Bulgaria because the value of F is higher than the value of F crit. Despite the high quality of Bulgarian beer and expanding every season portfolio of breweries companies with new productions and assortments, a large part of consumers in Bulgaria still prefer the German and Czech beer. This fact can be an objective reason for the increase of around 5% of the average import price of beer in Bulgaria.

**Table 6**  
**Anova: Two factors without reflection in years**

Years	DE – Export price, €/t	BG – Export price, €/t	DE – Import price, €/t	BG – Import price, €/t
2010	628.97	448.43	572.98	486.06
2011	626.38	467.32	569.51	463.11
2012	684.33	468.82	610.37	455.19
2013	685.83	488.60	684.21	460.96
2014	691.77	501.87	704.33	471.07
2015	718.64	599.18	656.17	485.83

Source: Eurostat, and calculation of author

**Table 7**  
**Germany, the average export price**

Source of variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	17870.4271	11	1624.5843	1.27442514	0.263648173	1.967546647
Columns	82082.4145	5	16416.483	12.8781121	2.65902E-08	2.382823301
Error	70111.7177	55	1274.7585			
Total	170064.559	71				

Source: Eurostat, and calculation of author

**Table 8**  
**Bulgaria, the average export price**

Source of variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	108285.337	11	9844.1216	0.812175297	0.627900081	1.967546647
Columns	174695.099	5	34939.02	2.882594302	0.022106237	2.382823301
Error	666637.717	55	12120.686			
Total	949618.152	71				

Source: Eurostat, and calculation of author

**Table 9**  
**Bulgaria, the average import price**

Source of variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	14607.0501	11	1327.9136	2.488255011	0.012998325	1.967546647
Columns	10285.7506	5	2057.1501	3.854704036	0.004580369	2.382823301
Error	29351.9958	55	533.67265			
Total	54244.7966	71				

Source: Eurostat, and calculation of author

## Conclusion

Vine and wine sector in the period of Bulgaria's membership in the EU and implementation of the CAP is characterized by descending developing production in Bulgarian agriculture. This is confirmed by the main indicators characterizing the production of wine grapes, table grapes and wine, as well as trade with wines. Throughout the period this sector reduces its performance and value. This gives reason to conclude that production is unsustainable and with declining competitiveness in domestic and external market.

The reasons for unstable positions which the vine and wine sector should be sought in the fact that after Bulgaria's accession to EU the main instrument impacting on the development of Bulgarian viticulture was the National program for support. The implemented measures for support of viticulture in the EU for Bulgaria did not have an impact on problems in the vine and wine sector. After the start of the new programming period in the sector is needed elaboration of a new national strategy for the development of Bulgarian vine and wine sector.

The production of beer in Bulgaria after the country's accession to the EU is at around 500 mln. liters, despite the increasing import from EU countries and third markets. This is confirmed by the main indicators characterizing the production of beer in the country and the trade with beer. During the observed period the share of export of Bulgarian beer in the world export is low, but production of barley in Bulgaria increased over 15% and the domestically produced beer is about 90% of consumption of beer in the country. This gives ground to conclude that the production of beer in Bulgaria is stable and competitive.

## References

- Bachev, H.**, 2016. Sustainability of Farms in Bulgaria, Sofia, *Avan-gard Prima*, Bulgaria, p. 192.
- Eurostat**, 2008-2016.
- ITC**, International Trade Centre, International trade in goods, Beer made from malt – 2203.  
www.Intracen.org
- ITC**, International Trade Centre, International trade in goods, Grapes, fresh or dried – 0806.

- www.Intracen.org
- Ivanov, B., T. Radev, P. Borisov, D. Dimitrova and P. Kirovsky**, 2012. Development and Evaluation of Sustainability in the Vine and Wine Sector, Sofia, *Avangard Prima*, Bulgaria, p. 138.
- Ivanov, B., T. Radev, D. Vachevska and P. Borisov**, 2009. Sustainability in Agriculture, Sofia, *Avangard Prima*, Bulgaria, p. 300.
- MAF, Agro-statistics, 2001-2016.
- NSI, Statistical Yearbook, 2001-2015.
- Pantaleeva, D.**, 2010. Situation, opportunities and prospects for development of viticulture in Bulgaria. *Economics and Management of Agriculture Journal*, **5**: 14-22.
- Toteva, D.**, 2015. Impact of the common agricultural policy of the eu on the development of wine viticulture in Bulgaria, Phd. Thesis, Institute of Agricultural Economics, *Agricultural Academy*, Bulgaria.
- Toteva, D. and P. Kirovsky**, 2011. Impact of the Common Agricultural Policy on competitiveness, opportunities and prospects for development of wine viticulture in Bulgaria. *Economics and Management of Agriculture Journal*, **3-4**: 33-40.

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