Chapter 19

The Trends and Prospects of Winemaking in Poland

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Abstract

Viticulture and winery origins in Poland date to the tenth century, but their tradition has been reborn in the last ten years, resulting in a development of small vineyards producing excellent wines not only for the local market. Due to the cold climate, usually short summers with moderate and low temperatures, the grapes are characterized by lower sugar content and higher acidity compared to those grown in the south of Europe. According to the European Union regulations, Poland was classified as the coldest wine-growing region (A) and officially acknowledged as a wine-producing country. The grapevine cultivars adopted to the harsh climatic conditions give the Polish grape wines some unique sensory features. The most popular varieties of grapes for the production of red wine are Regent, Rondo, Pinot Noir, Maréchal Foch, Cabernet Cortis, Tryumf Alzacji, Cascade and Dornfelder. For white wine production, Solaris, Riesling, Seyval Blanc, Pinot Gris, Johanniter, Jutrzenka, Hibernal, Aurora, Bianka, Traminer, Jutrzenka and Siberia are mostly used in Poland. This chapter presents Polish grape winery with its specificity and prospects for the future. The traditional products of Polish fermentation industry, fruit wines and meads, are also mentioned.

Keywords: Polish wines, wine yeast, L-malic acid decomposition, Polish wine regions

1. Introduction

However, Poland was not worldwide recognized as a wine-producing country, but the art of winemaking has been practiced there since the tenth century. Winery was introduced with Christianity and the first vineyards were cultivated by and wineries were established by Benedictine and Cistercian monks; however, wine was produced for religious purposes mainly.

The fruitful time for the Polish winery was the fourteenth century, during which many wineries were operating mainly in Silesia, Zielona Góra, Poznań, Toruń, Płock, Sandomierz, Lublin and Kraków.

Intensive development of wine making was in the age of enlightenment, when the viticulture and wine production were carried out in the Podole. Besides *Vitis vinifera*, hybrid varieties resistant to adverse climatic conditions were grown. After World War II, according to the authorities, two wine-growing regions were designated: the West (Zielona Góra region and Lower Silesia) and the Central (along the Pilica river). Vineyards planted in the communistic economy, however, have begun to bear losses, and in the 1960s, it was focused on the production of fruit wines. The tradition of viticulture and winery has been reborn in the last ten years, resulting in development of small vineyards producing excellent wines for the local market. Poland is located in the zone of the continental climate, where there are also wine regions such as Burgundy and the Loire Valley, Rioja, Piedmont and most of the vineyards of Austria, the Czech Republic, Slovakia or Romania. The climate in Poland is characterized by significant seasonal and daily fluctuations in temperature with the potential problems of frost and hailstorms during winters and springs. Due to the cold climate, usually short summers with moderate and low temperatures, the grapes are characterized by lower sugars content and higher acidity comparing to these grown in the south of Europe. A wine zone, most suitable for the cultivation of vines, is located on the latitude between 32°00′ and 52°00′ northern hemisphere and between 28°00′ and 42°00′ southern hemisphere [1].

Poland extends from the parallel 49°00′ N (south) to 54°50′ N (north), so about half of the country is situated in this area. At the latitudes between 49°00′ N and 52°00′ N, there are many regions in Europe known for their excellent wines, including some appellations in the region of Champagne (e.g. Reims) or German appellations the Rhine, mozelskie and Franconian. Krakow is located similarly [2]. Climate favourable for viticulture is characterized by an average annual temperature not less than 8°C, the average temperature of the hottest month not less than 17°C and the total active annual temperature 25°C. Some areas of Poland are also characterized by these conditions. The current climate changes are conducive to the development of Polish winemaking. The average annual temperature showed an upward trend (about 0.3°C per decade), transitional periods have been shortened, warm periods have been prolonged, the course of winters became milder, allowing the cultivation of early and very early varieties.

According to the European Union classification of climate for viticulture (Council Regulation (EC) No 479/2008), Poland was classified in the coldest wine-growing region (A) and officially acknowledged as a wine-producing country, altogether with, among others, Germany (except for Baden), the Czech Republic (except for Moravia), Belgium and the Great Britain.

Due to the thermal conditions, Polish territory was divided as follow: Region I—the west and southwest of the country, namely provinces of Lubusz, Lower Silesia, Opole, Silesian and southern parts of the provinces Wielkopolska and Lodz; Region II—threatened with greater extent of cold winters, covers the south and southeast of the country, i.e. the province Małopolska, Podkarpackie, świętokrzyskie and southern parts of the provinces of Lublin and Warsaw; and Region III—the other areas, where viticulture is impossible or very difficult [3].

Nowadays, the following winemaking regions can be distinguished in Poland; the largest and the best known vineyards are located in: (i) area of Zielona Góra (Lubuskie Province); (ii) Lower Silesia; (iii) vicinity of Kraków; (iv) area of Jasło and Krosno in the Podkarpackie Province; and (v) along the Vistula gorge (from Sandomierz to Puławy).

2. Wine yeasts

Fermentation in winemaking can either be natural, conducted by native yeasts present on the fruit skins and in the winery, or by selected yeasts strains. The microflora of fruits vary according to a number of factors, among others, the fruit variety, temperature, climatic conditions, soil, viticultural practices and fungicides applied to vineyards [4]. In view of this variability, to obtain high-quality wines of defined aroma and flavour, the inoculation with pure cultures of selected commercial yeasts is recommended. In addition, starter culture fermentations offer the advantages of a more predictable and rapid process, giving wines with high consistency in quality. Criteria for the selection and development of yeasts for wine fermentation encompass: (i) vigorous and complete fermentation of fruit juice sugars, without excessive yeast growth; (ii) fermentation at low temperatures 10–12°C; (iii) production of ethanol in high concentrations and ethanol tolerance of yeasts; (iv) growth and fermentation in musts containing sulphur dioxide; (v) uniform dispersion and mixing throughout the fermenting juice; (vi) low foaming ability; (vii) effective sedimentation at the end of the fermentation; (viii) balanced array of flavour metabolites; and (ix) genetic stability [4–6].

Moreover, for areas with unfavourable climatic conditions including Poland, the high acidity of fruit wines caused inter alia by the excess of malic and tartaric acids in the raw material is specific. In terms of fruits used in the Polish winemaking industry, both organic acids account for up to 90% of all the acids present in grapes, and malic acid content reaches 94–98% of total acids present in apples and cherries [4, 7]. The high level of organic acids unfavourably influences the organoleptic properties and biochemical, physical and microbial stability of wine. One of the strategies for solving this problem is biological deacidification by wine yeasts with an extended ability to degrade L-malic acid. Demalication process is conducted simultaneously with fermentation. Malate decomposition varies greatly and may reach 48%, depending on the strain. However, industrial wine yeasts *Saccharomyces cerevisiae* and *Saccharomyces bayanus*, with a demalication activity reaching 68%, have also been selected and well-characterized [8, 9]. *Saccharomyces* sensu stricto strains are usually considered as less effective in malic acid metabolizing than *Schizosaccharomyces pombe* and *Zygosaccharomyces bailii*, which are additionally characterized by high resistance to acidity and sulphur dioxide [10, 11]. The rather low malate decomposition in *Saccharomyces* spp. is explained by the absence of an active L-malate transport system, the low substrate affinity of the malic enzyme and the mitochondrial location of two malic isoenzymes [12]. The alternative in reduction of the acidity of musts and wines may be the application of mixed cultures of yeasts, composed of species degrading L-malate and L-tartrate, such as *Schizosaccharomyces malidevorans, Kloeckera* spp., *Candida* spp. and *Hansenula* spp. [13]. However, inoculation of musts with yeasts other than *S. cerevisiae* may be associated with the possible interactions between populations and adverse organoleptic changes in the final product. To avoid these limitations and combine desired biochemical and technological properties of yeasts, interspecific hybrids between *S. cerevisiae* and *S. pombe*, and *S. cerevisiae* and *S. bayanus* were obtained using the protoplast fusion method [6, 9, 11]. The hybrids show an increase in degradation of L-malate compared to *S. pombe* and are able to decompose up to 77% of malic acid present in musts [14]. Moreover, hybrids ability to decompose L-malic acid seems to be linked to their high resistance to acidic stress [7, 14]. The application of natural yeast hybrids is fully acceptable by the industry in contrast to yeast engineered by molecular genetic methods.

Besides the search for new yeasts and modification of traditional wine-yeast strains, another important direction in Polish winery involves the immobilization of yeasts. The immobilization of yeast cells in winemaking practices offers many advantages: (i) prolonged activity and stability of the biocatalyst; (ii) high volumetric productivity; (iii) shorter fermentation time; (iv) elimination of non-productive cell growth phases; (v) increased substrate uptake and yield improvement; (vi) feasibility of continuous processing; (vii) increased tolerance to high substrate concentration and reduced end product inhibition; and (viii) reduction of risk of contamination by undesired microorganisms [15].

In winemaking, yeasts immobilization has been used in continuous and batch production of wine, in a secondary fermentation, and to improve the sensory quality of finished products [15, 16]. Bonin et al. [17] and Bonin and Wzorek [18] tested immobilization of *S. cerevisiae* and *S. bayanus* on foam glass for long-term continuous winemaking of high-sugar musts attaining substantial improvement in efficiency of the process.

Immobilization of yeasts other than *Saccharomyces* spp. may improve sensory quality of wine compared to that obtained with free cells. It was reported that immobilized *Kluyveromyces marxianus*, cultivated on typical fruit pomaces from Polish varieties of apples, cranberries and chokeberries left over from juice extraction, produced significant quantities of aromas δ-decalactone and rose-like 2-phenyl ethyl alcohol [16].

Wines are considered to be the products rich in phenolic compounds. The phenolic wine constituents play an important role in the visual and gustative quality of red wines [19]. It is also known that wine yeasts are one of the factors decreasing the phenolic content of wines. The mechanism of this phenomenon is based on weak and reversible interactions mainly between anthocyanins and yeast walls by absorption. On the other hand, various yeast metabolites such as pyruvic acid and acetaldehyde were shown to react with different classes of phenolics, suggesting that it may be an important way of conversion into stable pigments during the maturation and ageing of wine [20]. Due to the impact of wine yeasts on the polyphenols content, studies are undertaken in order to select wine yeast strains that may advantageously modify phenolic profile and antioxidant properties of wine [21].

3. Grape winemaking in Poland

Currently, there are approx. 500 vineyards in Poland, ranging from small ones (up to 10 acres) to large ones (4 hectares and more). The most popular varieties of grapes for the production

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of red wine are Regent, Rondo, Pinot Noir, Maréchal Foch, Cabernet Cortis, Tryumf Alzacji, Cascade, Dornfelder. For white wine production Solaris, Riesling, Seyval Blanc, Pinot Gris, Johanniter, Jutrzenka, Hibernal, Aurora, Bianka, Traminer, Jutrzenka, Siberia are mostly used [2, 22]. Distribution of the most popular varieties is unequal. In the four provinces with the largest number of vineyards, i.e. Podkarpackie, Małopolskie, Lublin and Świętokrzyskie, the hybrid varieties: Regent, Rondo, Seyval Blanc, Bianca, Johanniter and Solaris dominate. In the western provinces, due to the slightly higher temperatures, mostly grape vine (*V. vinifera*): Lubuskie—Zweigelt, Pinot Noir and Riesling and in Lower Silesia—Cabernet Sauvignon, Pinot Noir, Riesling, Chardonnay and Pinot Gris are grown [2].

As the climatic conditions in Poland are still too severe for *V. vinifera* vines, most of the planted vineyards are composed of hybrids between *V. vinifera* and native North America species (French hybrids), with higher resistance to cold and pests. For wine produced from such cultivars, both the taste and chemical compound content are different when compared to the ones made of *V. vinifera* varieties. The only Seyval Blanc, from older varieties, is suitable for cultivation in Poland [3] because of its high fertility, resistance to frost and diseases. The newest Bianca and Siberia varieties are comparable to Seyval Blanc in mould disease resistance. Muscat of Odessa and Hibernal varieties are the leaders among grapevines for white wine production. Among varieties grown for red wine the best are German Rondo and Ukrainian Wiszniowyj Rannij.

In Poland, the researches on the usefulness of multiple genotypes of vine grown in cool climate have been carried out for many years, with main objective to evaluate the yield, tolerance/resistance to frost and susceptibility to disease-causing pathogens. The work conducted in 1987–1989 and 2005–2007 shown that plants assessed later, earlier began the growing season [23]. In 2012, technological maturity of grapes from a vineyard Srebrna Góra (Małopolska) near Krakow was examined [24]. It turned out that the fruit reached maturity about two weeks earlier than expected and technological parameters of must were similar to the parameters of musts obtained in a warmer climate.

The outstanding grapevine collection of the Research Institute of Pomology and Floriculture in Skierniewice, Central Poland, was established in 1992 and now comprises 234 cultivars. The investigations conducted in 2005–2009 [25] were focusing on the yielding, winter hardiness and susceptibility to fungal diseases (downy mildew, powdery mildew, grey mould and excoriose) of 25 selected cultivars: 14 white cultivars (e.g. Aurore, Bianca, Cayuga White, Reform, Refren, Seyval, Siberia, V 64035, V 71141), 9 red (e.g. Golubok, Cascade, Rondo, Marechal Foch, Regent, Leon Millot), and 2 rose (Delaware, Swenson Red). Berries ripened from the second half of August (Reform) until the second week of October (V 71141, Siberia). Vines of the hybrid V 64035 and cultivars Seyval and Cayuga White were the most productive. Vines of interspecific hybrids were less susceptible to frost damage and fungal diseases than cultivars of *V. vinifera* (Chasselas Dore, Ortega). Interspecific hybrids Seyval, Bianca, Siberia, Marechal Foch, Rondo and Regent were distinguished as the best yielding and the highest quality, suitable for commercial winemaking. Aurore, Delaware, Cascade and Golubok were relatively reliable in yielding, and their grapes may be used for the production of juice and home wines. The following cultivars of *V. vinifera* proved to be the most suitable for cultivation in Central Poland: Auxerrois, Pinot Gris, Pinot Noir, Riesling and Chasselas Blanc, classified as both wine and table cultivars [26].

Hybrid varieties from Podkarpacie: five for white wines (Aurora, Bianca, Muskat Odeski, Pearl of Zala, Prim), five for red ones (Alden, Frontenac, Leon Millot, Marechal Foch, Rondo) and Swenson Red for rose wine were also investigated [27]. Among the major discriminants tested, the extract was estimated from 146 (Prim) to 218.5 g/L (Leon Millot) and acidity from 7.3 (Prim) to 9.8 g malic acid/kg (Aurora) for white and from 8.1 (Leon Millot) to 17.9 g malic acid/kg (Frontenac) for red wines. Total polyphenols content expressed as mg catechin/kg d.w. was at the level from 14,380 (Frontenac) to 49,190 (Rondo). The level of polyphenols was also investigated in cultivars from the most famous Polish vineyard—Golesz, situated in Podkarpacie, next to Jasło [28]. Ten grapevine cultivars (five white—Muskat Odeski, Hibernal, Seyval Blanc, Jutrzenka, Bianca and five red-skinned—Marechal Foch, Frontenac, Heridan, Rondo, Swenson Red) harvested in 2006 were analysed. The level of polyphenols of white varieties was the lowest for Seyval Blanc and Bianca (40.5 mg/100 g f.w.) and the highest for Muskat Odeski (130 mg/100 g f.w.), for red varieties from 117 mg/100 g f.w. (Swenson Red) to 686.7 mg/100 g f.w. (Rondo). Both studies [27, 28] show that the richest in health-promoting polyphenols, among the varieties grown in Podkarpacie are white Muskat Odeski and red Rondo.

There are ongoing attempts to restore the vineyards in Szczecin Lowland. The climate of this area is significantly affected by the Baltic Sea and big water basins (Szczecin Lagoon, Dąbie Lake, the Odra River), providing additional moisture in the period of plants vegetation. The majority of the West Pomeranian Province belongs to the zone 7A on the Heinz and Schreiber's 'Map of zones of plant resistance to frost' [29, 30]. The quality of three *V. vinifera* varieties (Cabernet Sauvignon, Cabernet Franc and Pinot Noir) cultivated in Szczecin Lowland in Poland and in Bulgaria was compared [30]. Higher levels of extract, pH and lower organic acid content were observed in fruits grown in Bulgaria. Cabernet Sauvignon was characterized by the highest level of extract (av. 23.3%) and acidity irrespective of the harvesting area. The lowest extract level was observed in Cabernet Franc variety (17.2% grown in Poland and 22.9% in Bulgaria). Acidity of Pinot Noir was the lowest (0.65 and 0.42 grown in Poland and Bulgaria, respectively). NAI (anthocyanin index) was higher in fruits growing in Poland. Another studies [31] show that grapes from Regent cultivar had a higher content of organic acids, vitamin C and yielded more juice, compared to Cabernet Sauvignon fruits. Cabernet Sauvignon contained more substances giving the wine its red colour. Regent cultivar grapes expressed lower extract content (below 20%), which is in agreement with other authors research on the Regent variety grown in Poland [25, 32].

Cultivated in Poland, Cabernet Sauvignon grapes accumulate an average of 18% of sugar, while Regent 11–12.5% only. According to Polish regulations, grape musts from these fruits should be sweetened to reach the appropriate alcohol content in wines [31].

Also wines from Polish vineyards were under investigations. Seven white wines (Cuvee, Jutrzenka, Milia, Swenson Red, Bianca, Cuvee, Seyval Blanc) and three red ones (Cuvee and Leon Millot) produced in Golesz vineyard in 2003–2006 were analysed [33]. The acidity ranged from 4.0 (Milia) to 8.7 g malic acid/L (Seyval Blanc). The red wines were characterized by significantly higher antioxidant activity from 670 (Cuvee) to 745 mg Trolox/100 ml (Leon

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Millot) in comparison with white wines. Red wines were distinguished by high concentration of polyphenols, from 970 (Leon Millot) to 1350 mg of catechin/L (Cuvee). Wines from the same winery, from 2007 vintage obtained from red (Heridan, Frontenac, St. Croix, Sabbrevois, De Chaunac, Marechal Foch, Leon Millot, Cascade, Rondo and Regent) and white (St. Pepin, La Crescent, Adalmiina, Seyval Blanc, Swenson Red) were also scrutinized [34, 35]. The total phenolic content of the white wines varied from 180 (Seyval Blanc) to 242 mg/L (Swenson Red) and for the red ones from 970 (Leon Millot), 996 (Regent) to 1669 mg/L (Rondo). The total phenolic content of wines produced from *V. vinifera* fell between the ranges observed from the hybrid grapevines [35]. Rondo wine, produced from the multispecies hybrid grapevine, was the richest in total phenolics and phenolic acids.

The chemical characterization of wine produced from 10 Polish grape cultivars planted near Krakow (Garlicki Lamus vineyard at the Experimental Research Station Garlica Murowana) was conducted [36]. Six white cultivars (Aurora, Bianca, Jutrzenka, Muskat Odeski, Seyval Blanc and Siberia) and four red ones (Marechal Foch, Leon Millot, Rondo, Regent) were investigated. The tartaric acid content varied from 224 (Leon Millot) to 705 mg/L (Marechal Foch) and from 458 (Aurora) to 1528 mg/L (Siberia) for the red and white wines, respectively. Among the red wines, Regent was the wine with the highest antioxidant activity (10.5 mM Fe) and polyphenol concentration (3.16 g GA/L), whereas the lowest values were noted for Leon Millot (5.75 mM Fe and 0.82 g GA/L, respectively). In the white wine group, Jutrzenka was observed to have the highest antioxidant potential (3.17 mM Fe) and polyphenols content (0.51 g GA/L), while Seyval Blanc had the lowest antioxidant activity (0.77. mM Fe) and Bianca total polyphenols content (0.28 g GA/L). The white wines were much richer in organic acids (succinic, malic and tartaric acids) in comparison with the red wines. The total acidity was lower, while the pH was higher in the red than in the white wines. Some of the wines, particularly red Regent and white Jutrzenka, displayed high antioxidant activity and polyphenols levels. It should be highlighted that wine production from Jutrzenka cultivar does not require any agro-chemical pretreatment, and thus it can be classified as ecological manufacturing [27].

Clarification is an important stage in wine production. Effectiveness of selected wine clarification methods (tannins, gelatine or bentonite) was also studied [37]. The results showed that the particular method does not determine the wine sensory quality but can affect the total extract. The application of the gelatin-tannic acid mixture was characterized by the higher efficiency compared to the use of bentonite.

4. Polish traditional fruit wines and meads

Poland is one of the major fruit producers in Europe with approximately 3-million tons of fruit, mainly apples, which are also utilized for wine production [4]. In some Polish regions, fruit wines are recognized as traditional or regional products: e.g. wines from cherries (*Prunus avium*) in the region Świętokrzyskie; from sour cherries in the province Wielkopolska; from plum in the province Zachodniopomorskie [38].

The extensive studies on the apple wines conducted by, among others, Bonin [39], Satora et al. [40] and Kunicka-Styczyńska [41–43], aimed at the determination of the influence of fruit processing, pectinolytic enzyme application, biological deacidification on antioxidant and volatile compounds profile of wines. The trimeric fractions of proanthocyanidins were identified as the causes of bitterness of apples wines and eliminated by clarifying with selected gelatines with small amount of low molecular proteins [44, 45].

The adsorption of polyphenols in apple musts and wines clarification with some bentonite preparations was also investigated, finding CLARIT BW125 (dioxosilanes, China) as the most efficacious [19]. Later studies [46] focusing on the levels of nucleic acid degradation products of apple wines fermented with preparations made of sediment wine yeast autolysate, demonstrated an elevated concentration of purine and pyrimidine bases and uric acid. The inhibiting effect of tannin in chokeberry must on the winemaking process was also considered [47]. Much attention has been paid to assessing pulp processing conditions to maintain biologically active compounds, especially polyphenols [48]. The effect of pulp treatment on polyphenols changes in blackcurrants and sour cherries musts and wines was investigated resulting in the highest extraction of polyphenols obtained after pectinolysis with Rohapect MA Plus (AB Enzymes, Germany) and Pektopol PM (Pectowin, Poland), respectively [49, 50].

Tradition of mead-making in Poland has been cultivated for ages. The most popular traditional flavoured Polish meads are: (i) Bernardine mead—with the addition of hops, iris rhizomes and dried or fresh rose petals, rose jam or rose oil; (ii) Castellan mead—with the addition of hops, vanilla pods and roots or fresh celery leaves; (iii) Capuchin mead—with the addition of hops, ginger, vanilla pods and nutmeg; (iv) Hop mead—with the addition of hops and raisins; (v) Camp mead—with the addition of hops, cinnamon, cloves and dried juniper berries; (vi) Lithuanian mead—with dried juniper berries and elder flower; (vii) Spicy mead—with the addition of hops, cinnamon, ginger, nutmeg, cloves and peppercorns; (viii) Cracowian mead —with the addition of hops, cinnamon and lemon peel; (ix) Polish mead(also known as the Russian) —with the addition of hops, dried berries of blackcurrant and valerian root; (x) Mound mead—with the addition of orange and lemon; (xi) Old Polish mead—with the addition of ginger, cinnamon, pepper and elder flower; and (xii) Lord mead—with the addition of dried raspberry, lemon, orange and dried rose petals [51].

5. Final remarks

Polish winemaking relies both on frost tolerant grapevine cultivars and fruits grown in this climate zone. Fermented alcoholic beverages become increasingly important in a Polish export. According to Eurostat, sales to foreign markets reached 35.2-mln litres in 2013, which is about a quarter of the total output. Polish wines, both grape and fruit ones, are becoming more widely recognized not only in Europe but in the world, winning the markets of Germany, Slovenia, Slovakia, Denmark, Switzerland, Latvia as well as Australia, Japan, Hong Kong and the United States. To face the shrinking market of classic wines, some traditional manufacturers as well as newly established companies have attempted to premiumise the category. They also offered a wide range of quality fruit wines, priced at the level of grape wines, and frequently presented as organic (Aronica-Jantoń) or regional products (Vin-kon).

The modern history of Polish grape winery is built by enthusiasts, forming the vineyards in the regions to allow the grapevine cultivation. The legal conditions for the production of wine have also been changed. It is permissible to use sucrose in order to enrich the must before fermentation, or to raise the potential alcoholic strength of 3% in relation to the volume, which give the Polish winemakers greater opportunities to obtain the wine a pleasant reception. By 2015, the annual production of grape wine in Poland was limited to 50 thousand hectolitres, with no demand of any restrictions in planting vineyards. Starting from 2016, any restrictions in this regard are also ceased, which promoted the development of many small vineyards particularly in the southern regions of Poland. Mechanisms of support for wine producers have been replaced by a system of direct payments, as being in force for other agricultural crops [52]. Planting the vineyards and wine production become more popular.

In the light of the law, Poland is exempted from the obligation to the classification of vine varieties and any variety registered at least in one of the European countries can be grown in Polish vineyards. Moreover, amendments to the legal act simplify rules of wine labelling and allow for the name of the vine variety and vintage to be put on the label of all categories of wine. On the basis of the regulations, producers up to 1000 hectolitres of wine per year, only from the grapes originated from their own vineyards, are entitled to release Polish grape wines on the market freely and legally [53]. Apart from the legal regulations, return towards organic foods and oenological tourism fashion create additional opportunities for the Polish vineyards development and wider popularization of Polish grape wines.

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