

STUDIES ON THE QUALITY AND AUTHENTICITY OF WHITE WINES FROM OLTENIA

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ABSTRACT

For white wines, in addition to the level of the main chemical constituents defined for each category and type, the properties of fruitiness, aroma and expressiveness, typical of varieties and areas of origin, are fundamental quality criteria. In addition, these products must be offered to consumers in a perfect state of clarity and with lasting stability over time.

The capitalization of the viticultural potential that Romania has, in order to obtain sustainable competitive advantages on foreign markets, requires the creation and promotion of an identity of Romanian wine, based on analytical investigations to certify the quality and natural chemical composition of wines.

Determining the quality and authentication of wines involves several aspects, such as geographical origin, year of production, variety, producer and quality. It is important that the proof of the authenticity of the wine is based on those chemical parameters that do not change during vinification process or that are difficult to falsify.

INTRODUCTION

Wine is a widely consumed product and establishing its authenticity is one of the most important aspects in food quality and safety.

For white wines, in addition to the level of the main chemical constituents defined for each category and type, the properties of fruitiness, aroma and expressiveness, typical of varieties and areas of origin, are fundamental quality criteria. In addition, these products must be offered to consumers in a perfect state of clarity and with lasting stability over time.

The transfer from grapes to must and further into wine of variety-specific aromas, the correct direction of the transformation of must into wine, the creation of conditions for the products to evolve positively, the numerous interventions regarding the antiseptic and antioxidant protection and the achievement, at the level of current requirements, of clarity and stability are the main features of white vinification, which gives it a very complex and evolved character "(Gheorghiuță M. et al. - 2002).

The increasingly improved technical and technological processes involved in the operation of clarifying and deburring musts lead to the total removal of undesirable impurities, but also of small fragments of skins and core, the only carriers of varietal aromas specific to each variety. In such situations, wines lack fruitiness, aromatic "expressiveness" and varietal typicality.

Lately, in the conditions of fierce competition already manifested on the world wine market, the demands of knowledgeable consumers have increased considerably, especially for white wines, which require a high degree of finesse, expressiveness and well-defined varietal characters (Popa A. et al., 2015).

Determining the quality and authentication of wines involves several aspects, such as geographical origin, year of production, variety, producer and quality (Christoph N. et al., 2003).

It is important that the proof of the authenticity of the wine is based on those chemical parameters that do not change during vinification process or that are difficult to falsify (Banu, C. et al., 2013).

The main objectives of the study were determining the quality parameters and the main indices of authenticity of some white wine samples from different wineries in Oltenia area.

MATERIAL AND METHOD

To carry out this study we used wines from several vineyards in Oltenia, with a reputation for obtaining high quality white wines and a national and international reputation

Thus, from the Drăgășani vineyard, - Crama Avincis we analyzed the following white wines Crâmpoșie selecționată, Fetească regală, Sauvignon Blanc and Tămâioasă românească, from the South-Mehedinți vineyard Severin – Crama Domeniile Vînju Mare we used Chardonnay, Sauvignon Blanc and Tămâioasă românească wines and from the Segarcea vineyard – Crama Domeniile Coroanei Segarcea winery we analyzed the wines obtained from Fetească albă, Sauvignon Blanc, Chardonnay and Tămâioasă românească.

All wines were analyzed from an organoleptic point of view.

For the calculation of the main quality indicators alcohol - glycerol and ash - ash was determined in the Oenology laboratory of the Faculty of Horticulture and SCDVV Drăgășani the alcoholic concentration of wines, glycerol contents, acidity, ash and dry extract (Muntean Camelia, Băducă C., Stoica Felicia, 2001).

RESULTS AND DISCUSSIONS

Based on the chemical analyzes performed in the oenology laboratory, the contents in metered alcohol, glycerol, mineral substances and non-reducing dry extract were determined.

With these data were calculated the ratios between the weight of metered alcohol and glycerol, as well as the ratios between the weight of the non-reducing dry extract and ash, indicators that attest not only the quality of wines but also their naturalness.

To determine the alcohol-glycerol ratio, the alcohol content is multiplied by 10 to obtain the amount of alcohol by volume.

The amount of alcohol by volume is then multiplied by 0.79 (molecular weight) to give the amount of alcohol by weight. Then by mathematical calculation the ratio between the weights of the two elements is determined.

The variation limits of this ratio are between 5.5 and 13.5, with an average of 8.5 for Romanian wines.

To determine the extract - ash ratio, the extract is considered 100%, and the ash represents % of the extract. There is no linear relationship between the reduced extract and the ash.

These indicators are mainly considered when determining the degree of naturalness of wines and the compositional balance of products.

It is mentioned that the degree of naturalness of the wines and the normal physico - chemical balance are achieved when the proportion of glycerol compared to alcohol and ash (mineral substances) compared to the non - reducing extract are as close as 10%.

The results regarding the analysis of the main quality parameters of the white wines obtained at Crama Avincis from Drăgășani vineyard are presented in Table 1.

Table 1

The main compositional characteristics of white wines from Crama AVINCIS

Wine sample	Alcohol %vol.	Tot. acid. g/l H ₂ SO ₄	Volat. acid. g/l H ₂ SO ₄	Glycerol g/l	Extract unred g/l	Ash, g/l	Glycerol × 100 / alcohol	Ash × 100 / extract unred.
Sauvignon	13,10	4,13	0,32	10,23	23,26	2,18	9,89	9,37
Fetească regală	12,0	4,26	0,34	9,11	22,18	2,06	9,62	9,29
Crâmpoșie selecționată	11,7	4,11	0,35	8,16	20,44	1,82	8,84	8,90
Tămâioasă românească	12,3	4,22	0,37	9,07	23,17	2,26	9,34	9,75

The alcohol content of the wines varied, depending on the grape variety used, between 11.7% vol (Crâmpoșie selecționată) and 13.10% vol for Sauvignon wine.

The wine obtained from the aromatic grape variety had an alcohol content of 12.3% vol with residual residual sugar and the Fetească regală wine recorded 12% vol alcohol.

The total acidity was, in all cases, more than 4 g / l in H₂SO₄ and more than 6 g / l in tartaric acid (C₂O₆H₆), the lowest content being in the selected Crâmpoșie wine (4.11g/l H₂SO₄), and the highest for Fetească regala wine (4.26 g/l H₂SO₄).

The glycerol contents, as well as those in alcohol, showed an accentuated variability, being comprised between 8.16 g/l (Crâmpoșie selecționată) and 10.23 g/l (Sauvignon).

Very good glycerol contents also existed in the Fetească regală and Tămâioasă românească wines, registering values of over 9 g / l (9.11 g/l and 9.07 g/l, respectively).

With the best extractivity (over 23 g/l) the Sauvignon and Tămâioasă românească wines were presented, followed by the wines obtained from Fetească regală (22.18 g/l) and Crâmpoșie selecționată.

Ash contents of over 2 g/l existed in the wines of Fetească regală (2.06 g / l), Sauvignon (2.18 g/l), Tămâioasă românească (2.26 g/l) and under 2 g/l l in the Crâmpoșie selecționată wine (1.82 g/l).

The quality indices expressed by the ratios glycerol × 100 / alcohol and ash × 100 / non-reducing extract came considerably closer to the ideal level (10%) for the Tămâioasăromânească and Sauvignon wines, presenting values between 9.34 and 9.88 for the ratio glycerol × 100 / alcohol and between 9.29 and 9.75 for the ratio ash × 100 / non-reducing extract, signifying important criteria for the quality and compositional balance of the products.

The parameters of attesting the authenticity of the wines, the Alcohol / Glycerol, and Extract / Ash ratios, through the values obtained for all the wines analyzed from CramaAvincis from Drăgășani vineyard, indicate that we are in the presence of natural, authentic, high quality wines and held in accordance with the category to which they belong(Stoica F. et al., 2015) .

The levels of the main characteristics of the wines obtained in the Vînju Mare winery listed in table 2 are, on the whole, with values of the main quality parameters analyzed, very well in the general picture of the wines taken in the study.

Table 2

The main compositional characteristics of white wines from Vînju Mare

Wine sample	Alcohol %vol.	Tot. acid. g/l C ₂ O ₆ H ₆	Volat. acid. g/l H ₂ SO ₄	Glycerol g/l	Extract unred g/l	Ash, g/l	Glycerol × 100 / alcohol	Ash × 100 / extract unred.
Sauvignon Blanc	13.96	5.41	0.34	9.43	17.35	1.97	11.69	11.35
Chardonnay	14.31	5.41	0.40	9.46	18.91	2.08	11.95	10.99
Tămâioasă românească	13.03	6.25	0.57	9.87	18.94	2.03	10.42	12.73

The alcohol content is over 13% vol., for all white wines (Sauvignon 13.96% vol., Chardonnay 14.31% vol., Tămâioasă românească 13.03% vol.), highlights the superior potential of these varieties in this respect in Vînju Mare viticultural area.

The total acidity of the analyzed white wines, expressed in tartaric acid, registers lower values for Sauvignon and Chardonnay wines 5.41 g/l (3.60 g/l H₂SO₄), while the Tămâioasă românească wine has an acidity of 6,25 g/l (4.16 g / l H₂SO₄).

This slight deficit in the acidity of white wines can be explained by the extremely high temperatures of year of production, a particularly hot and dry year.

The values of volatile acidity vary between 0.34 g/l acetic acid in Sauvignon and 0.57 g/l in the case of Tămâioasă românească wine, values that do not endanger the health and organoleptic qualities of wines.

The glycerol content, the main by-product of alcoholic fermentation, has values consistent with the alcohol content. Thus, the wines of Sauvignon Blanc and Chardonnay register close values of this parameter, 9.43 g/l, respectively 9.46 g/l. The Romanian incense has a slightly higher content of 9.87g /l.

The white wines of Vînju Mare present a good total extractivity, oscillating between 22.30 at Chardonnay and 23.95 g/l at Tămâioasă românească.

These contents of total extract, conjugated with those of glycerol, give the wines obvious fullness and body in the conditions of a residual sugar content higher than 4 g/l.

The white wines of Vînju Mare also incorporate appreciable contents of mineral substances. The ash ratios in all cases reach the value of 2 g/l.

For the glycerol / alcohol ratio, the white wines of Vînju Mare exceed in all cases the ideal threshold set at 10%.

To determine the extract - ash ratio, the extract is considered 100%, and the ash represents% of the extract. There is no linear relationship between the reduced extract and the ash.

The results regarding the analysis of the main quality parameters of the wines from Crama Domeniile Coroana, Segarcea are presented in Table 3.

According to the relative carbohydrate contents of the grapes at the time of harvest, the alcoholic levels resulted, between 12.1% vol. (Fetească albă) and 13.4% vol. (Tămâioasă românească). With an alcohol content of more than 13% vol. Chardonnay wine is also included, and those obtained from Sauvignon grapes exceeded by 0.1 - 0.2% vol. the threshold of 12.0% vol. alcoholic.

The total acidity, with the exception of Chardonnay wine, showed values of more than 4 g/l in H₂SO₄ or more than 6 g/l in C₂O₆H₆ in all other varieties, being in accordance with the Rules for the application of L.V.V. in force.

The rigorously controlled vinification conditions attracted the formation in wines of some contents low in volatile acidity, comprised between 0.36 g/l (Fetească albă) and 0.40 g/l (Tămâioasă românească).

Table 3

The main compositional characteristics of white wines from Domeniile Coroanei Segarcea

Wine sample	Alcohol %vol.	Tot. acid. g/l H ₂ SO ₄	Volat. acid. g/l H ₂ SO ₄	Glycerol g/l	Extract unred g/l	Ash, g/l	Glycerol × 100 / alcohol	Ash × 100 / extract unred.
Chardonnay	13,2	3,66	0,38	10,3	23,3	2,25	9,88	9,66
Fetească albă	12,1	4,06	0,36	9,1	22,6	1,99	9,53	8,80
Sauvignon	12,2	4,23	0,39	9,2	22,7	1,92	9,55	8,46
Tămâioasă românească	13,4	4,15	0,40	10,8	23,8	2,21	10,20	9,28

The relationship between Gay-Lussac fermentation and glycerol-pyruvic fermentation is faithfully reflected in the glycerol contents. This explains the higher proportions of glycerol (10.3 g/l and 10.8 g/l) for Chardonnay and Tămâioasă românească wines, in which the alcoholic levels also showed values of 13.2% vol. and 13.4% vol. In the wine obtained from Sauvignon, the glycerol content was 9.2 g/l.

The non-reducing extract presented values determined by the genetic nature of the variety, but also by some interventions at the primary vinification.

The qualitative level of the raw material, but also the slight maceration applied to the vinification of Chardonnay and Tămâioasă românească grapes determined the highest contents in extract from their wines (23.3 g/l and 23.8 g/l, respectively). For the other wines, the extract showed values close to 22.6 - 22.7 g/l (Fetească albă and Sauvignon, respectively).

The contents in mineral substances (ash) generally follow proportionally the sizes of the non-reducing extract, being over 2 g/l in Chardonnay and Tămâioasă românească wines and below 2 g/l in Sauvignon wines (1.92 g/l), Fetească albă (1.99 g/l).

The proportions of glycerol compared to the dosed alcohol are a little below 10% or even above this threshold considered ideal (in the case of Tămâioasă românească wine).

The proportions of ash to the non-reducing extract between 8.46 (Sauvignon) and 9.66 (Chardonnay) are considered to favorably express the relationship between the two oenological quantities.

Regarding the control of authenticity, the analyzed reports show, through the obtained values, that the wines are natural. A slight deviation of the recorded values of the analyzed indices is registered for the Tămâioasă românească variety, being susceptible to the addition of alcohol, but the high values of the extract and glycerol show that the raw material, the grapes were very well ripened, accumulating important sugar contents.

CONCLUSIONS

During the paper, studies were carried out on the quality and authenticity of white wines obtained from foreign varieties - Sauvignon, Chardonnay and Romanian

varieties-Crâmpoșie selecționată, Fetească albă, Fetească regală și Tămâioasă românească, in famous vineyards and wineries in Oltenia

The studies undertaken showed particularly convincing that in all the studied areas, the white wines studied are of an exceptional quality, highlighted both by the harmonious chemical composition and by the very pleasant organoleptic properties.

The parameters of attesting the authenticity of the wines, the Alcohol / Glycerol, and Extract / Ash ratios, through the values obtained for all the wines analyzed from the AVINCIS winery from Drăgășani vineyard, indicate that we are in the presence of natural, authentic, high quality wines and held in accordance with the category to which they belong.

The values of the analyzed reports indicate that all the wines obtained in the VÎNJU MARE vineyard are quality wines, authentic and natural, corresponding to the variety and the viticultural area from which they come.

Regarding the control of authenticity in the case of the study of white wines obtained in the DOMENIILE COROANEI winery, Segarcea, the analyzed reports show, through the values obtained, that the wines are natural. A slight deviation of the recorded values of the analyzed indices is registered for the Romanian Tămâioasă variety, being susceptible to the addition of alcohol, but the high values of the extract and glycerol show that the raw material, the grapes were very well ripened, accumulating important sugar contents.

The main quality indices analyzed, the alcohol / glycerol ratio and non-reducing extract / ash, are especially important in determining the degree of naturalness of wines and the compositional balance of products.

In all the analyzed cases, for all the white wines from all the wineries, the values of these quality indicators show us that we are in the presence of high quality, natural and authentic wines.

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