

COMPARATIVE RESEARCHES CONCERNING THE QUALITATIVE CHARACTERISTICS OF THE SUPERIOR WINES DERIVED FROM WINE-GROWING CENTRE OSTROV

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Abstract

So as to realize the whole image of the quality evolution of the superior, dry, white wines, derived from wine-growing centre Ostrov, we established the variability estimates of the physical and chemical parameters concerning White Fetească, Italian Riesling and Sauvignon grapes variety of wine, along three successive crops: 2004, 2005 and 2006. The most increased variability was registered by the Free Sugar parameter (between 34 and 81%), no matter which grapes variety of wine was analysed. The most stable parameters of the three grapes variety of wines, were Density (with a medium variation coefficient, smaller than 1%) and Alcohol content (with a medium variation coefficient, smaller than 4%), parameters which can be considered typical for this category of white wines. The sort of wine which presented the most increased homogeneity of the physical and chemical parameters, along the three years investigated, was the Italian Riesling sort. The most heterogeneous values were registered by the Sauvignon sort of wine.

Key words: *White superior wines, physical and chemical characteristics, variability estimates, statistic differences*

INTRODUCTION

The wines produced to SC Ostrovit SA carry the specific nature of this place, with calcareous soil and droughty climate, with humid atmosphere, due to the Danube influence. In the wine-growing centre Ostrov, the grapes varieties for wine (especially White Feteasca, Italian Riesling, Royal Feteasca) are cultivated on a surface counting 245 ha and the grapes varieties for consumption (Italia, Afuz Ali, Muscat, Hamburg, Sultanina, Moldova) are cultivated on a surface of 936 ha. The wines for current consumption have an Alcohol content of 10-10,4 vol. % and the superior quality wines, obtained of White Feteasca, Italian Riesling, Merlot, Cabernet, Sauvignon sorts, have an Alcohol content between 10,5 -10,4 vol. % [1, 5].

The climatic peculiarities, as well as some anthropic elements, which modulate the action of the environmental agents (applied phytotechny, the cropping moment, the vinification technology applied), determine the annual variability of the wines' physical and chemical parameters [3, 4, 6].

This study recommends a comparative qualitative characterization of the dry wines, obtained of the White Feteasca, Italian Riesling and Sauvignon grapes varieties, made by S.C. OSTROVIT S.A., in 2004, 2005 and 2006 production years.

MATERIAL AND METHOD

The determinations were made in preceding stage of the wines bottling and commercialization. There were comparatively analysed the physical and chemical parameters of White Feteasca (n=33), Italian Riesling (n = 30) and Sauvignon (n = 31), ingathered from 2004, 2005 and 2006 crops. The following quality parameters of the wine have been analysed: d_{20}^{20} (picnometric method STAS 6182/8-71), Alcohol % vol. (picnometric method STAS 6182/6-70), total dry extract mg/l (densimetric method STAS 6182/9-80), Free Sugar g/l (iodometric method STAS 6182/18-81), Unreducing Extract g/l, Total Acidity g/l $C_4H_6O_6$ (titrimetric method STAS 6182/1-79), Free SO_2 mg/l (iodometric method STAS 6182/13-72) and Total SO_2 mg/l (iodometric

method STAS 6182/13-72) [2,3,4,7]. The obtained results were statistical processed using the professional program COHORT [2, 7, 8].

RESULTS AND DISCUSSION

The first table shows the variability estimates of physical and chemical parameters, belonging to White Feteasca sort of wine, concerning the whole investigated period (2004 -2006).

Table 1

The variability estimates of White Feteasca sort of wine samples corresponding to 2004, 2005 and 2006 crops cumulatively (n = 33)

Parameter	X±s	s	CV %
D ²⁰ ₂₀	0,9937 ± 0,001	0,000001	0,110
Alcohol (vol %)	11,363 ± 0,489	0,239	4,304
Total dry extract (g/l)	23,012 ± 2,150	4,625	9,346
Free sugar (g/l)	2,184 ± 0,749	0,561	34,305
Unreducing extract (g/l)	20,600 ± 2,388	5,703	11,592
Total acidity (g/l C ₄ H ₆ O ₆)	5,491 ± 0,386	0,149	7,038
Free SO ₂ (mg/l)	38,696 ± 4,149	17,217	10,722
Total SO ₂ (mg/l)	129,279 ± 17,731	314,392	13,716

Generally, it is noticed that the physical and chemical parameters of White Feteasca grapes variety of wine, are not characterized by excesiv values of the variation coefficient, with one exception, namely the Free sugar parameter (34,305 %).

The second table shows the obtained results in the case of Italian Riesling grapes variety of wine, concerning the whole investigated period (2004 -2006).

Table 2

The variability estimates of Italian Riesling sort of wine samples corresponding to 2004, 2005 and 2006 crops cumulatively (n = 30)

Parameter	X±s	s	CV %
D ²⁰ ₂₀	0,9914 ± 0,011	0,000121	1,113
Alcohol (vol %)	11,206 ± 0,297	0,088	2,650
Total dry extract (g/l)	21,493 ± 1,077	1,160	5,012
Free sugar (g/l)	1,268 ± 0,448	0,201	35,358
Unreducing extract (g/l)	20,243 ± 0,948	0,899	4,684
Total acidity (g/l C ₄ H ₆ O ₆)	5,895 ± 0,274	0,075	4,664
Free SO ₂ (mg/l)	39,000 ± 5,717	32,689	14,660
Total SO ₂ (mg/l)	128,733 ± 11,057	122,271	8,589

In this case too, the main parameter which was affected of excesiv variation is also the Free sugar (35,358 %). In the case of Italian Riesling grapes variety of wine, distinguishes a bit increased variation coefficient, accordingly to the Free SO₂ parameter (14,66 %).

The results, concerning the variability estimates of the analyzed physical and chemical parameters, in the case of the wine obtained from the Sauvignon grapes variety of 2004-2006 crops, are presented in the table 3.

Table 3

The variability estimates of Sauvignon sort of wine samples corresponding to 2004, 2005 and 2006 crops cumulatively (n = 31)

Parameter	X±s	s	CV %
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D ²⁰ ₂₀	0,9937 ± 0,001	0,000001	0,170
Alcohol (vol %)	12,251 ± 0,559	0,313	4,568
Total dry extract (g/l)	25,580 ± 3,135	9,830	12,157
Free sugar (g/l)	3,389 ± 2,770	7,768	81,763
Unreducing extract (g/l)	22,097 ± 0,927	0,859	4,195
Total acidity (g/l C ₄ H ₆ O ₆)	5,280 ± 0,307	0,094	5,830
Free SO ₂ (mg/l)	39,966 ± 6,365	40,516	15,926
Total SO ₂ (mg/l)	145,700 ± 26,241	688,631	18,010

The Free sugar parameter was characterized by a variation coefficient value, higher than 81 % and the parameters connected to the wine sulphitation operations, had variation coefficients moreover than 15 %.

Observing the first figure, we noticed that the most stable parameters of the three wines, were Density (with a medium variation coefficient smaller than 1 %) and the Alcohol content (with a medium variation coefficient smaller than 4 %). The Free sugar parameter was the most exposed to variations, no matter the grapes variety, having a medium variation over 50 %.

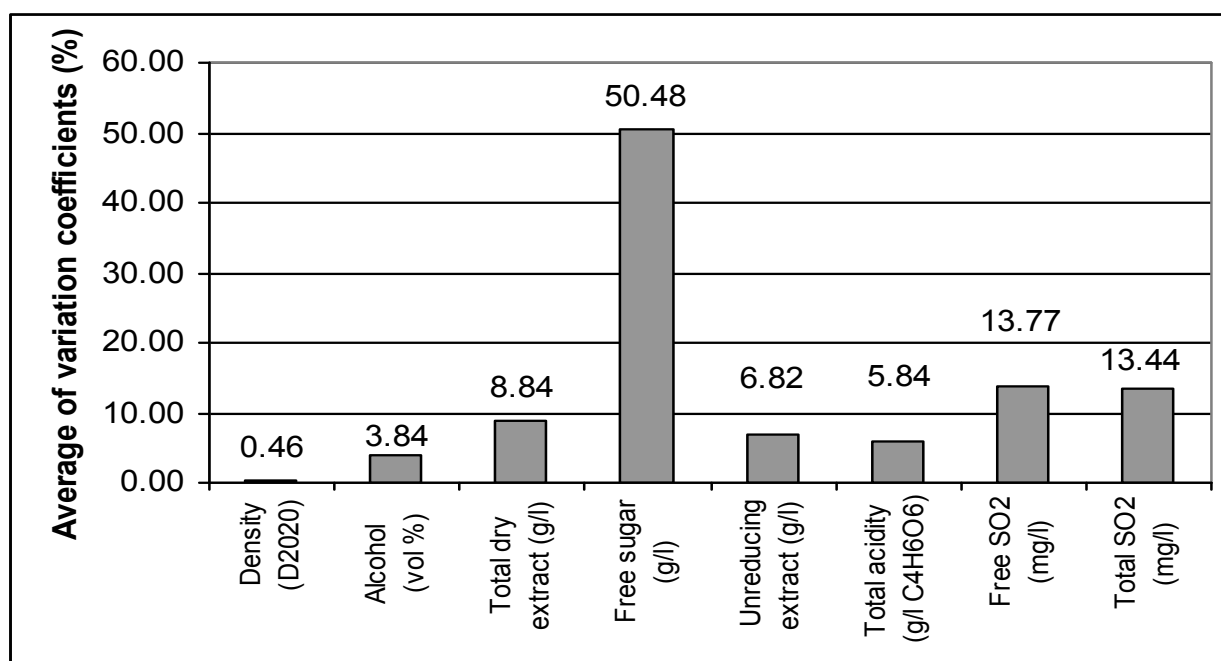


Figure 1. The variation coefficients average of the physical and chemical parameters, which characterized the analysed wines

The grapes variety of wine, which presented the most higher homogeneity for physical and chemical parameters, along the three years investigated, was Italian Riesling (the lowest medium variation coefficient = 9,59 %). The most increased values were registered in the case of Sauvignon wine, for which it was established a medium variation coefficient of 17,83 % (figure 2). We can say that the Italian Riesling grapes variety was the best adapted to climatic conditions, which varied along the analysed period. This sort of wine pointed out the most homogeneous characteristics, while the Sauvignon wine proved to be the most exposed and misfit.

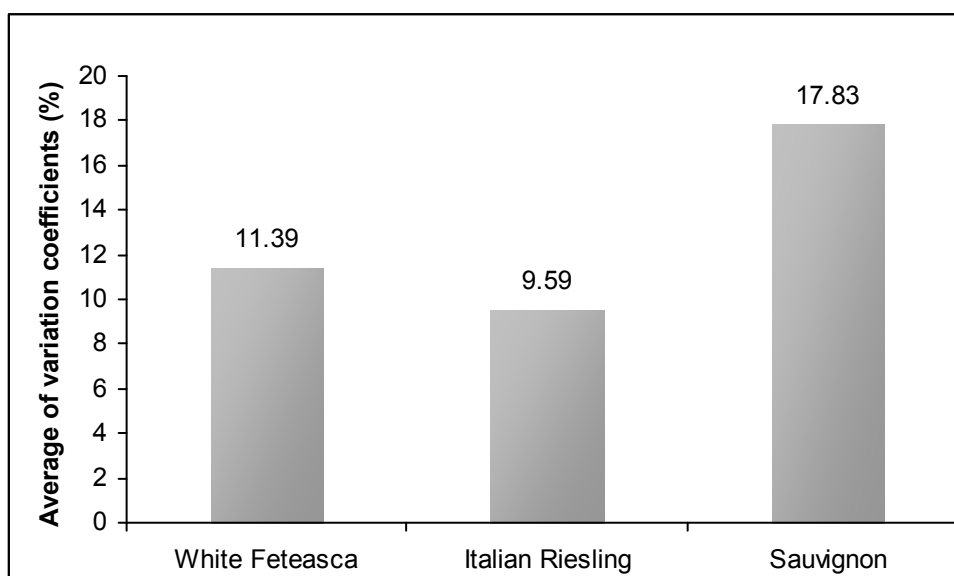


Figure 2. The variation coefficients average of all the parameters, which characterized every sort of wine (White Feteasca, Italian Riesling and Sauvignon)

The table 4 presents the meaning of averages differences, following the application of the t test (Student), for all the physical and chemical parameters, in the case of the three studied wines.

Table 4

The meaning of averages differences (t test) of the physical and chemical parameters concerning the three superior wines

Pairs D²⁰₂₀	Average (a)	Average (b)	t
White Feteasca (a) – Italian Riesling (b)	0,9937	0,9914	1,144
White Feteasca (a) – Sauvignon (b)	0,9937	0,9937	0
Italian Riesling (a) – Sauvignon (b)	0,9914	0,9937	1,163
Pairs Alcohol (%)	Average (a)	Average (b)	t
White Feteasca (a) – Italian Riesling (b)	11,363	11,206	1,563
White Feteasca (a) – Sauvignon (b)	11,363	12,251	6,791***
Italian Riesling (a) – Sauvignon (b)	11,206	12,251	9,154***
Pairs Total dry extract (g/l)	Average (a)	Average (b)	t
White Feteasca (a) – Italian Riesling (b)	23,012	21,493	3,592**
White Feteasca (a) – Sauvignon (b)	23,012	25,580	3,797***
Italian Riesling (a) – Sauvignon (b)	21,493	25,580	6,852***
Pairs Free Sugar (g/l)	Average (a)	Average (b)	t
White Feteasca (a) – Italian Riesling (b)	2,184	1,268	5,950***
White Feteasca (a) – Sauvignon (b)	2,184	3,389	2,394*
Italian Riesling (a) – Sauvignon (b)	1,268	3,389	4,181***
Pairs Unreducing extract (g/l)	Average (a)	Average (b)	t
White Feteasca (a) – Italian Riesling (b)	20,600	20,243	0.792
White Feteasca (a) – Sauvignon (b)	20,600	22,097	3.342*
Italian Riesling (a) – Sauvignon (b)	20,243	22,097	7,722***
Pairs Total acidity (g/l C₄H₆O₆)	Average (a)	Average (b)	t
White Feteasca (a) – Italian Riesling (b)	5,491	5,895	4,744***
White Feteasca (a) – Sauvignon (b)	5,491	5,280	2,411*
Italian Riesling (a) – Sauvignon (b)	5,895	5,280	8,252***
Pairs Free SO₂	Average (a)	Average (b)	t

White Feteasca (a) – Italian Riesling (b)	38,696	39,000	0,243
White Feteasca (a) – Sauvignon (b)	38,696	39,966	0,939
Italian Riesling (a) – Sauvignon (b)	39,000	39,966	0,692
Pairs Total SO₂	Average (a)	Average (b)	t
White Feteasca (a) – Italian Riesling (b)	129,279	128,733	0,148
White Feteasca (a) – Sauvignon (b)	129,279	145,700	2,914**
Italian Riesling (a) – Sauvignon (b)	128,733	145,700	3,309**

As noticeable from the table 4, the Density parameter did not differ significantly between neither one of the analysed wine pairs. This fact shows that the parameter Density is rather typical for the wines category (white, dry wines), than for the grapes variety of wines, respective White Feteasca, Italian Riesling or Sauvignon.

One can also see, that the Alcoholic Content % did not differ significant between the White Feteasca and Italian Riesling grapes varieties of wines. However, the White Feteasca and Italian Riesling grapes varieties of wines, had a very significant low alcoholic concentration, comparative to the Sauvignon grapes variety of wine.

The parameter Total dry extract was very significant different between the three grapes varieties of wine. The highest value was registered to Sauvignon grapes variety (25,58 %), followed by White Feteasca grapes variety (2,184 g/l) and Italian Riesling grapes variety (21,493 %).

The parameter Free sugar presented a grapes variety specificity, having significant and very significant different values between the wines. The highest value one can see in the case of Sauvignon grapes variety (3,389 %), followed by White Feteasca grapes variety (2,184 g/l) and Italian Riesling grapes variety (1,268 g/l).

Regarding the Unreducing extract parameter, it was noticed that registered values, in the case of White Feteasca and Italian Riesling grapes varieties of wines, did not differ significant. Instead, the Sauvignon and White Feteasca, respective Italian Riesling grapes varieties of wines, differed significant and very significant. So, the highest value of the Unreducing extract parameter was specific to Sauvignon grapes variety of wine, followed by White Feteasca and Italian Riesling grapes varieties of wine.

The Total Acidity parameter could also be considered as being peculiar to every grapes varieties of wines. Matter of fact, all grapes varieties of wines presented at least significant differences between the values of this parameter. White Feteasca grapes variety of wine presented a very significant decreased value of Total Acidity, comparative to Riesling Italian grapes variety of wine and a significant grown value, comparative to Sauvignon grapes variety of wine. The Italian Riesling grapes variety of wine presented a very significant grown value of the Total Acidity, comparative to Sauvignon grapes variety of wine. The highest values of this parameter were peculiar to the Italian Riesling grapes variety of wine, followed in order by the White Feteasca and Sauvignon grapes varieties of wines.

The analysed grapes varieties of wine did not differ concerning the Free SO₂ quantities, though appeared some distinctly significant differences between Sauvignon and White Feteasca or Italian Riesling grapes varieties of wines. These differences due to the higher quantity of Total SO₂ present in the Sauvignon grapes variety of wine, comparative with other two sorts of wines.

Our analysis showed that the least peculiar parameters of the grapes variety of wine were the Density and the Free SO₂ content. In practice, the values of these parameters seem rather characteristics of the wine category, respective superior, white, dry wines, then grapes variety characteristics. Instead, parameters as: Total Dry Extract, Free Sugar or Total Acidity presented significant differences between each pair of analysed grapes varieties. The fact is showing that the value of these parameters could be considered typical for every sort of wine.

CONCLUSIONS

◆ The wine obtained of White Feteasca grapes variety had the quality parameters values specific to superior, white and dry wines. The physical and chemical parameters did not present excessive values of the variation coefficients, single exception being the Free Sugar parameter (CV=34,305 %).

◆ Concerning the Italian Riesling grapes variety, the values of the quality parameters were typical for superior, white and dry wines. The main parameter which was affected by excessive variations was also, the Free sugar (CV=35,358 %). Concomitantly, we can observe the existence of an easily growing variation, in the case of Free SO₂ parameter (8,589 %).

◆ The Sauvignon grapes variety of wine, pointed out quality parameters suitable to superior, white and dry categories of wines, but there were affected by increased variations. So, the Free Sugar parameter showed a variation coefficient value higher than 81 %. A rather increased variation coefficient was observed at the parameters connected to the wine sulphitation, moreover than 15 %.

◆ The Italian Riesling grapes variety was the best adapted to climatic conditions, peculiar to 2004-2006 period. So, the wine produced of Italian Riesling grapes variety, revealed homogenous characteristics.

◆ The Sauvignon grapes variety of wine proved to be the most exposed and misfit.

◆ We may assert that the Density, Alcoholic content and Free SO₂ parameters are peculiar to superior, white and dry wines, while the Total Dry Extract, Free Sugar and Total Acidity parameters could be considered typical for every sort of wine.

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