

## QUALITATIVE CHARACTERISTICS OF THE WINE OBTAINED FROM WHITE FETEASCA GRAPES' VARIETY, DERIVED FROM WINE-GROWING CENTRE OSTROV, ALONG THREE SUCCESSIVE CROPS 2004, 2005 AND 2006

### PARTICULARITĂȚI CALITATIVE ALE VINULUI OBTINUT DIN SOIUL FETEASCA ALBA, PROVENIT DIN CENTRUL VITICOL OSTROV, PE PARCURSUL A TREI RECOLTE SUCCESIVE 2004, 2005 SI 2006

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#### Abstract

*There have been analysed the physical and chemical characteristics ( $d^{20}$ , alcohol % vol., total dry extract mg/l, free sugar g/l, unreducing extract g/l, total acidity g/l  $C_4H_6O_6$ , free  $SO_2$  mg/l, total  $SO_2$  mg/l) definitive for the wine quality made from the White Feteasca grapes' variety, in three successive years: 2004, 2005 and 2006. The climatic peculiarities of the forenamed years, determined the appearance of some quality statistic differences, as follows:  $d^{20}_{20}$  diminished significantly in 2006 comparative to the precedents years, the quantity of alcohol increased distinctly significant in 2006 comparative to 2004 and 2005, the total dry extract and unreducing extract diminished distinctly significant in 2005 against 2004, total acidity diminished very significantly in 2006 against 2004, respectively 2005 and the total  $SO_2$  content was significantly and very significantly lower in 2006 against 2004, respective 2005. There have been observed no differences between the annual crops, concerning the parameters: free sugar and free  $SO_2$ . Concludevely, the wine from 2006 was stronger, more dry and less sulfited, comparative with wines from 2004 and 2005.*

**Key words:** White Feteasca, quality, physical and chemical characteristics, statistic differences

#### INTRODUCTION

The commercial company S.C. OSTROVIT S.A. belongs to the wine-growing centre Ostrov from Ostrov Vineyard, placed in the region of the Danube Terrace. The type of the soil from Ostrov Vineyard is the chernozem, with argillaceous – sandy fibber, the soil's reaction being alkaline. The temporal character of the precipitations determined the droughty specific of the zone, affecting the productive potential of the wine grapes cultivated here. The years 2004 and 2005 were exceptions, because the precipitations' amount was more over the annual average registered so far (the wine obtained having a less content of sugars and a higher acidity). Instead, 2006 was less rainy.

This study recommends a comparative characterization of the dry wine's quality, obtained from the White Feteasca grapes' variety, made by S.C. OSTROVIT S.A., in the production years: 2004, 2005 and 2006. The physical and chemical analysis emphasis the wine's peculiayties, in the preceding stage of bottling and commercialization. The White Feteasca wine is characterized through harmony and complex flavour, having the alcohol content between 11,0 and 12,6 % and being registered in the category of superior wines [1,5,6].

#### MATERIAL AND METHOD

There have been taken for analysis samples of unbottled wine, from the White Feteasca grapes' variety, three successive years, as follows: 10 repetitions in 2004, 13 repetitions in 2005 and 10 repetitions in 2006. There have been analysed the following

quality parameters of the wine:  $d_{20}^{20}$  (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.

## RESULTS AND DISCUSSION

The first table distinguished the quality parameters' values of the White Feteasca dry wine, concerning 2004 year. We also noticed the normal values, of all analysed parameters, mentioned in the scientific literature.

**Table 1**

**The variability estimates of the physical-chemical parameters, according to 2004 crop (n =10)**

Parameter	Normal limits	$\bar{X} \pm s_{\bar{x}}$	s	CV %
$d_{20}^{20}$ (g/ml)	0.983-1.003	$0.994 \pm 0.00046$	2.1655E-07	0.046
Alcohol (vol %)	10.5-12.5	$11.140 \pm 0.206$	0.042	1.849
Total dry extract (g/l)	18-24	$24.340 \pm 1.040$	1.082	4.274
Free sugar (g/l)	Maximum 4 g/l	$2.170 \pm 0.177$	0.031	8.110
Unreducing extract (g/l)	Dry extract - Free sugar	$22.170 \pm 0.980$	0.962	4.420
Total acidity (g/l $C_4H_6O_6$ )	4.5-9	$5.846 \pm 0.254$	0.064	4.000
Free $SO_2$ (mg/l)	Maximum 50	$40.000 \pm 0.000$	0.000	0.000
Total $SO_2$ (mg/l)	Maximum 200	$133.000 \pm 14.621$	213.777	10.933

The majority of the values are placed in normal limits. The total dry extract gets a bit over the limit of 24 g/l, while the free sugar situates to the middle of the admitted value for the dry wines, circumstance which determines the slightly increase of the unreducing extract. The sulphitation degree did not overstep the admitted limits.

There are noticeable, in the second table, the averages' values of the wine's quality parameters, obtained from the 2005 year crop.

**Table 2**

**The variability estimates of the physical-chemical parameters, according to 2005 crop (n =13)**

Parameter	$\bar{X} \pm s_{\bar{x}}$	s	CV %
$d_{20}^{20}$ (g/ml)	$0.994 \pm 0.001$	1.0442E-06	0.102
Alcohol (vol %)	$11.115 \pm 0.182$	0.033	1.637
Total dry extract (g/l)	$22.123 \pm 2.244$	5.037	10.143
Free sugar (g/l)	$2.431 \pm 0.844$	0.714	34.718
Unreducing extract (g/l)	$19.738 \pm 1.815$	3.294	9.195
Total acidity (g/l $C_4H_6O_6$ )	$5.351 \pm 0.410$	0.168	7.662
Free $SO_2$ (mg/l)	$40.000 \pm 0.000$	0.000	0.000
Total $SO_2$ (mg/l)	$136.846 \pm 17.296$	299.141	12.638

In 2005, all the quality parameters showed values situated into admitted limits, without exceptions. The behavior of the quality parameters of the wine, for 2006, are presented in the table 3.

**Table 3**

**The variability estimates of the physical-chemical parameters, according to 2006 crop (n =10)**

Parameter	$\bar{X} \pm s_{\bar{x}}$	s	CV %
d <sup>20</sup> <sub>20</sub> (g/ml)	0.9930 ± 0.001	1.384E-06	0.110
Alcohol (vol %)	11.910 ± 0.536	0.288	4.500
Total dry extract (g/l)	22.841 ± 2.348	5.514	10.279
Free sugar (g/l)	1.880 ± 0.907	0.823	48.244
Unreducing extract (g/l)	20.150 ± 3.299	10.887	16.372
Total acidity (g/l C <sub>4</sub> H <sub>6</sub> O <sub>6</sub> )	5.319 ± 0.202	0.041	3.797
Free SO <sub>2</sub> (mg/l)	35.700 ± 6.848	46.900	19.182
Total SO <sub>2</sub> (mg/l)	115.700 ± 14.221	202.233	12.290

All the quality parameters' values were situated in normal limits, which have been described in scientific literature, however we noticed a notable diminution of the free sugar content, probably due to prolongation of the fermentation and transformation of the sugar in alcohol. Otherwise, the wine obtained in 2006 is stronger (alcohol vol % ) than the wine obtained from the crops of the 2004 and 2005 years.

The meaning of averages' differences (test t) emphasis the impact of the climatic factors from successive years (2004, 2005, 2006), over the quality of the dry wine White Feteasca (table 4).

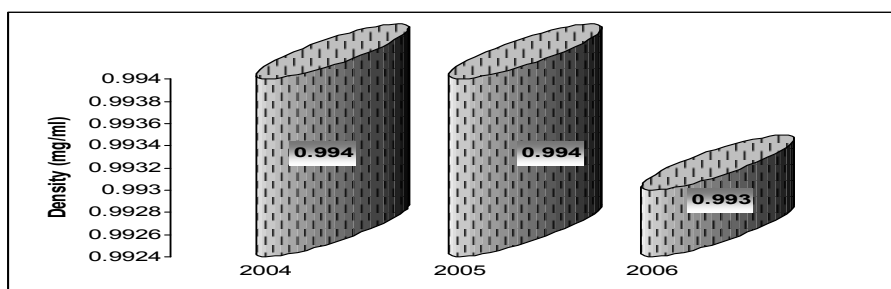
**Table 4**

**The meaning of averages' differences (t test) for all the quality parameters, between the annual crops**

Parameter	Pears	Average (a)	Average (b)	t
d <sup>20</sup> <sub>20</sub> (g/ml)	2004 (a) – 2005 (b)	0.9940	0.9940	0.000
	2004 (a) – 2006 (b)	0.9940	0.9930	2.886*
	2005 (a) – 2006 (b)	0.9940	0.9930	2.377*
Alcohol (vol %)	2004 (a) – 2005 (b)	11.140	11.115	0.309
	2004 (a) – 2006 (b)	11.140	11.910	4.238**
	2005 (a) – 2006 (b)	11.115	11.910	4.491**
Total dry extract (g/l)	2004 (a) – 2005 (b)	24.340	22.123	3.149**
	2004 (a) – 2006 (b)	24.340	22.841	1.846
	2005 (a) – 2006 (b)	22.123	22.841	0.745
Free sugar (g/l)	2004 (a) – 2005 (b)	2.170	2.431	1.083
	2004 (a) – 2006 (b)	2.170	1.880	0.992
	2005 (a) – 2006 (b)	2.431	1.880	1.501
Unreducing extract (g/l)	2004 (a) – 2005 (b)	22.170	19.738	3.817**
	2004 (a) – 2006 (b)	22.170	20.150	1.855
	2005 (a) – 2006 (b)	19.738	20.150	0.382
Total acidity (g/l C <sub>4</sub> H <sub>6</sub> O <sub>6</sub> )	2004 (a) – 2005 (b)	5.846	5.351	3.349**
	2004 (a) – 2006 (b)	5.846	5.319	5.143***
	2005 (a) – 2006 (b)	5.351	5.319	0.245
Free SO <sub>2</sub> (mg/l)	2004 (a) – 2005 (b)	40.000	40.000	0.000
	2004 (a) – 2006 (b)	40.000	35.700	1.698
	2005 (a) – 2006 (b)	40.000	35.700	1.698
Total SO <sub>2</sub> (mg/l)	2004 (a) – 2005 (b)	133.000	136.846	0.564

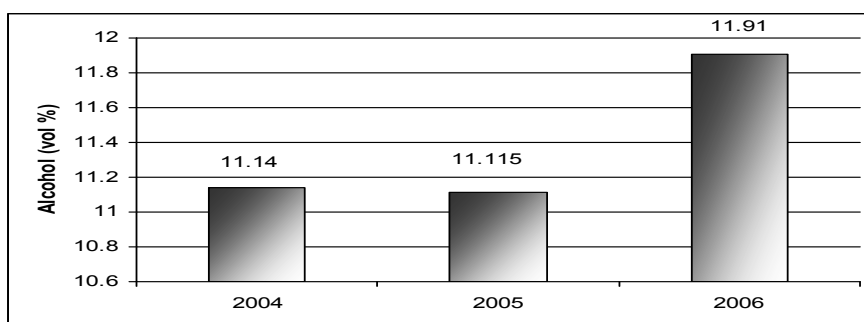
	2004 (a) – 2006 (b)	133.000	115.700	2.682*
	2005 (a) – 2006 (b)	136.846	115.700	3.132***

The density of the wine (figure 1) was meaningful smaller in 2006 against 2004 (2.886\*) and 2005 (2.377\*).



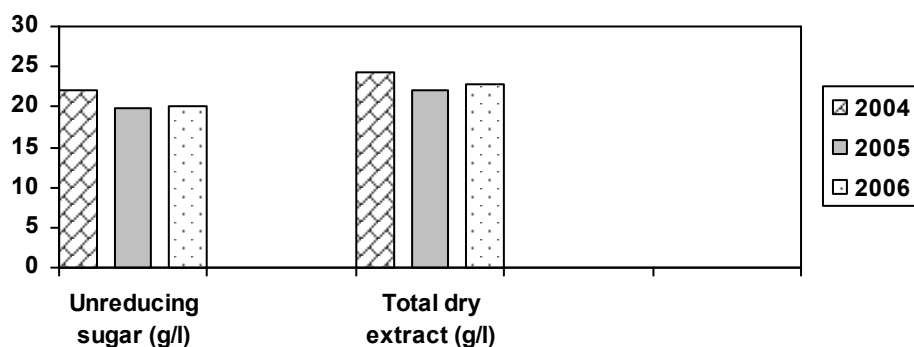
**Figure 1. The meaning of averages' differences (t test) for wine's density  $d_{20}^{20}$**

The percent of alcohol (in vol %) was distinctly meaningful increased in 2006, comparative to 2004 (4.238\*\*) and 2005 (4.491\*\*). However, the content in free sugar did not differ meaningful between the three studied crops, being even little reduced in 2006, but probable fermented a pretty long while (figure 2).



**Figure 2. The meaning of averages' differences (t test) for wine's content in alcohol**

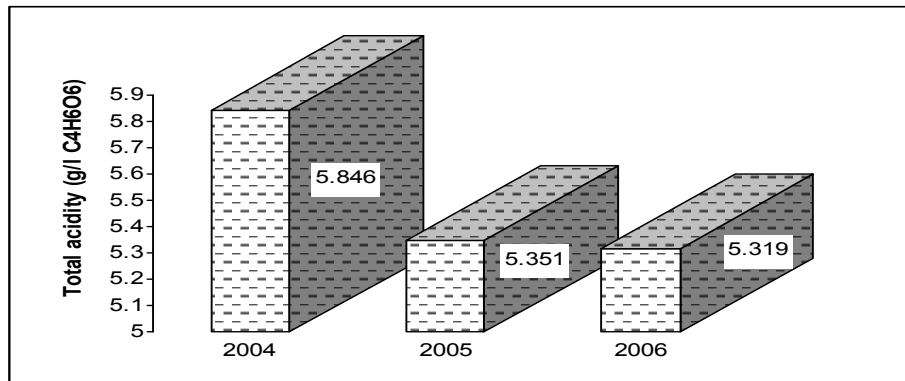
The unreducing extract (figure 3) was distinctly meaningful increased in 2004 comparative to 2005 (3.817\*\*), which explains the distinctly meaningful increase of the total dry extract in 2004 against 2005 (3.149\*\*).



**Figure 3. The meaning of averages' differences (t test)**

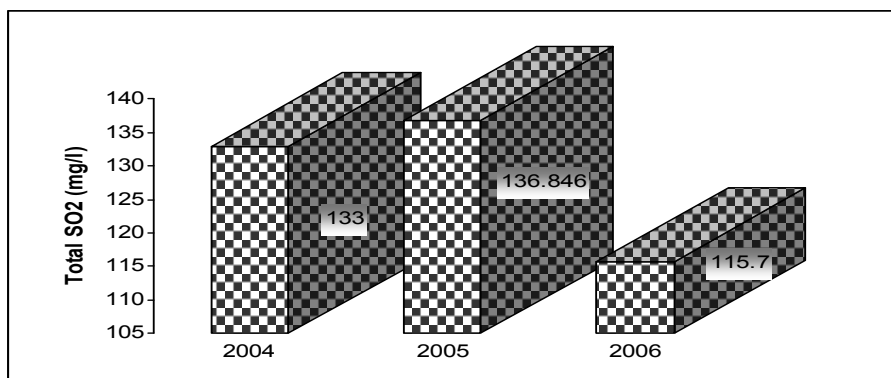
## for wine's unreducing extract and total dry extract

The total acidity (figure 4) was distinctly meaningful increased in 2004 comparative to 2005 (3.349\*\*) and very meaningful increased in 2004 against the crop 2006 (5.143\*\*\*). The wine of the crop 2004 was a dry wine and sourish at the same time. The acidity did not differ meaningful between the wine of the crops 2005 and 2006.



**Figure 4. The meaning of averages' differences (t test) for wine's total acidity**

The quantity of free SO<sub>2</sub> (figure 5) did not present meaningful differences between the samples of wine derived from the three forenamed years. On the other hand, the quantity of total SO<sub>2</sub> was distinctly meaningful increased in 2004 comparative to 2006 (2.682\*) and very meaningful increased in 2004 comparative to 2006 (3.132\*\*\*). The explanation dues to the abundant sulphitation of wine, coming from 2004 and 2005 (rainy years), with the intention of breaking the intense growth of the mouldes developed in the ingathering's crop period.



**Figure 5. The meaning of averages' differences (t test) for wine's total SO<sub>2</sub>**

## CONCLUSIONS

◆ The tehnological processes of wine preparation were guided so that, no matter the processing year, all the parameters were framed between the limits established by the quality standards.

◆ The wine of the year 2004 was the most acid, having in consequence a pronounced sourish taste and an enough increased total dry extract (a little more above the superior limit of the range).

◆ The wine of the year 2005 had the most sweet taste, comparative to the wines from 2004 and 2006 (yet ranging among the category “dry wine”), the other parameters having intermediary values compared to 2004 and 2005.

◆ The wine of the year 2006 was the strongest (content in alcohol) and the most dry (small content of sugar).

◆ The total sulphitation, having increased values in the rainy years (2004 and 2005), did not affect the dry wines' quality, but maintained in optimum limits the fermentation flora's concentration.

The commercial company S.C. OSTROVIT S.A. produces dry wines of superior quality, due to the systematic control over the production technological proceedings. In this sense, the climatic differences, to which the crops coming from forenamed years had been submitted, did not introduce fundamental changes in the wines' quality, even if they manifest peculiar to the level of the certain physical-chemical parameters.

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