

STUDIES REGARDING THE FRAUDULENT PRACTICES AND OTHER NONCONFORMITIES ENCOUNTERED IN THE WINES MARKETED IN DOLJ COUNTY DURING THE PERIOD 2006-2014

VLADU CRISTINA EMANUELA⁽¹⁾, S VESCU PETRE⁽²⁾

⁽¹⁾*The Ministry of Agriculture and Rural Development, The General Direction of Control, Anti-fraud and Inspections. The County Department of Inspection, Verification and Control, Dolj, Ion Măiorescu, no. 4, Romania, cvld.isctv@yahoo.com*

⁽²⁾*University of Craiova, Faculty of Agronomy, psavescu@gmail.com
Corresponding author: psavescu@gmail.com*

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ABSTRACT

The aim of the study is to analyse: the types of nonconformities existing in the wines displayed for marketing, the number of wine samples with detected additions that are not allowed, the geographic area that they come from and the evolution of nonconformities during the studied period.

The analysis of the wines existing in the commercial network of Dolj County during the period 2006-2014 highlights nonconformities and falsifications of the wines through the dilution of the wine with water, non-vinous addition of alcohol, through hiding some faults or alterations of the wine, through additions and the use of any practices that are illegal according to the current wine law.

INTRODUCTION

According to current wine legislation, falsifications represent the addition of alcohol and water in wine, the change of the composition of stum and wines or the concealing of some defects or alterations of the wine by adding substances forbidden by current wine legislation, the failure to comply with the limits of the ratio glucose/fructose, the use of flavouring substances, synthetic sweeteners or colorants, the acidification/deacidification of the wines over the limits provided in the law or the preparation of the wines from other raw materials than the legal ones.

During the modern era, falsifications vary from the addition of alcohol to the addition of products that endanger the consumers' health, especially colorants, preservatives, etc. (Constantin Banu et al., 2013)

Most of the cases, falsifications do not harm wine's innocuity, but it distorts its characteristics and affects consumer's image and trust in the naturalness of the product (Bulancea Mircea, Gabriela Râpeanu, 2009).

Evaluation of wines' naturalness is made by analysis of physical and chemical parameters in agreement with the requirements of the legal standards of these products and the information on the product's label (Vicol Constantin, 2011).

In order to obtain consumer's trust, authenticity, as a component part of the quality, it should be certain and certified (Stoian Viorel, 2001, Popa A, 2012).

MATERIAL AND METHOD

The study was carried out on a number of 259 wine samples taken during the period of 2008-2014 from different economic agents carrying out wine marketing activities – bulk and bottled- in Dolj County by the wine inspectors within the State Inspection for Dolj Technical Wine Control.

The study material was represented by table wine samples, by geographic area (IG) or Origin Designation (DOC) white and red, having different quality depending upon the sugar content, obtained by wine producers, natural and legal persons in Romanian vineyards.

Also, in a lower percentage, import wines or from inter-community trade intended for marketing in Dolj County.

The official control of physical, chemical and organoleptic parameters in wines sampled by I.S.C.T.V. inspectors from different economic agents who carry out wine marketing – bulk and bottled- in Dolj County was carried out in one of the five approved laboratories of the Ministry of Agriculture and Rural Development, which meet the general criteria for operation of testing laboratories established by the ISO/CEI 17025 standard, nominated in Annex 1 of Order no. 272 of December 9th, 2010.

The presence of non-vinous alcohol and water was determined through an isotopic analysis performed by the Laboratory of mass spectrometry, chromatography and ion physics within the National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca.

RESULTS AND DISCUSSIONS

From 259 samples of wine taken, 107 samples were of bulk wine, approved for sale in authorised stores which sell bulk wine according to H. G. 1134 since 2002 and, from 2010, The 224 art fro 2010, the rest of the 101 samples were samples of bottled wine. Concerning the proportion of samples analysed depending on the color of the wine, it was about 50%, i.e. 127 samples of white wine and 152 samples of red wine (Table 1).

Table 1
Analysed samples situation according to the year of sampling and analysis, marketing, form and sugar content

Year	Samples number	From which:		From which:		From which:			
		Bulk	Bottled	White	Red	Dry	Semi-dry	Semi-soft	Soft
2006	36	23	13	19	17	15	8	12	1
2007	33	20	13	17	16	12	11	9	1
2008	14	6	8	7	7	3	5	4	2
2009	42	19	23	23	19	13	14	12	3
2010	18	3	15	11	7	5	5	8	0
2011	31	16	15	14	17	7	11	11	2
2012	16	2	14	5	11	3	8	5	0
2013	34	8	26	15	19	11	14	9	-
2014	35	10	25	16	19	15	14	6	-
Total	259	107	152	127	132	84	90	76	9

Sample distribution according to the origin revealed that most of the wine analysed samples, bulk or bottled, were produced by the economic agents of the Vrancea County-72, Dolj County - 44, Buz u County - 32 samples, other counties: Prahova, Constanta, Tulcea, Mehedinti, Gala i, Ia i, Bac u, Vâlcae being less represented (Table 2).

Table 2
The situation of the analysed samples depending on the county or country where they have been produced and/or imported

Year	JUDE UL														ARA						TOTAL				
	BC	BZ	CT	DB	DJ	GL	IS	MH	PH	TL	TM	TR	VL	VN	VS	Bulgaria	R. Moldova	Spainia	Austria	Ungaria	Fran a	Italia	Total na .	Total interna .	Total grand
2006	1	4	1	1	4	-	-	5	-	3	1	-	-	13	1	-	2	-	-	-	-	-	34	2	36
2007	-	2	-	-	8	-	-	1	5	-	1	-	-	10	-	-	3	2	1	-	-	-	27	6	33
2008	-	3	-	-	4	-	-	-	2	-	-	-	-	3	-	-	1	-	-	-	-	1	12	2	14
2009	1	6	-	1	14	1	2	1	1	5	-	-	-	9	1	-	-	-	-	-	-	-	42	-	42
2010	-	5	1	-	2	1	1	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	18	-	18
2011	-	2	4	-	3	1	1	2	4	-	2	2	-	10	-	-	-	-	-	-	-	-	31	-	31
2012	-	3	-	-	2	4	1	-	-	1	-	-	-	2	-	3	-	-	-	-	-	-	13	3	16
2013	-	4	5	-	4	-	-	-	-	-	-	-	-	10	1	7	1	-	-	1	-	1	24	10	34
2014	-	3	3	-	3	1	1	-	2	2	-	-	1	7	2	9	-	-	-	-	1	-	25	10	35
Total	2	32	14	2	44	8	6	9	14	11	4	2	1	72	5	19	7	2	1	1	1	2	226	33	259

From 259 wine samples , bottled or bulk , there were submitted to analysis a number of 33 wine samples coming from intra-community trade or imported, their percentage was pretty small, 12,74%, but enough, taking into account their share on the Romanian market.

Following the analysis of 259 wine samples in terms of organoleptic and physicochemical, and izotopic, there were discovered various nonconformities in a number of 100 samples, these representing a percentage of 38% of the total analyzed samples, the biggest share being represented by the addition of citric acid, colorants and sweeteners in wine, together with non-vinous alcohol and water (Fig. 1).

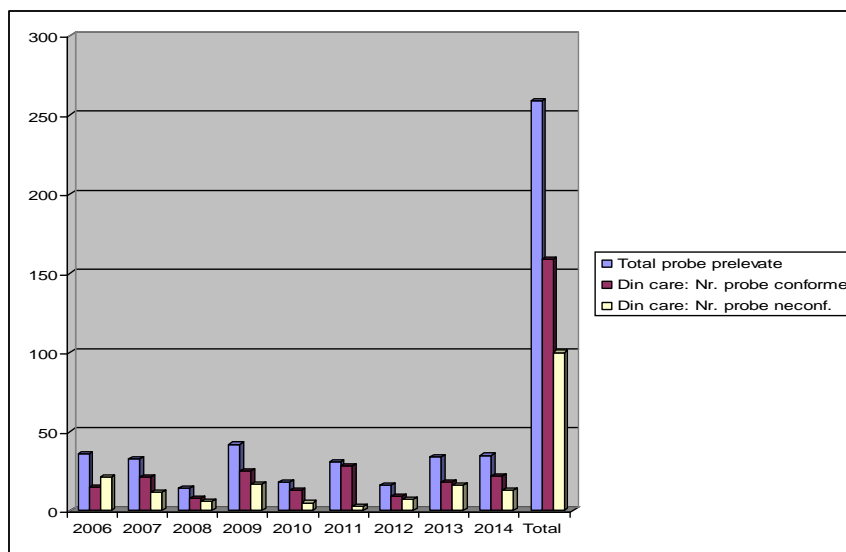


Fig. 1 The situation of wine samples collected depending on conformities/nonconformities

Of the 57 wine samples depreciated or with composition problems, in 29 wine samples were identified various deposits of protean or tartaric nature, nonspecific colors or odors especially due to oxidation or to the production of wine in conditions of poor hygiene, and in 19 samples were identified composition problems, namely: the value of extract, alcohol, total acidity was less than the minimum allowed by wine law in force (Table 3).

Also, in a single wine sample, from the Republic of Moldova, was identified the presence of malvidin diglucoside exceeding the maximum allowable limit of 15 mg/l for red wines, which is forbidden by Romanian regulations that expressly provide in art. 23 of G.D. 769/2010 that „wine resulting by processing directly producing hybrid grapes is intended exclusively for family consumption, obtaining alcohol of vinous origin and wine vinegar”.

Table 3

The situation of non-compliant samples from the organoleptic and compositional collected in 2006-2014 from commercial network in Dolj county

Year	Total collected	Non conf samples acc. to organoleptic analyses	Samples that not fit acc to sugar	No. of nonconforming samples in terms of composition			
				Val. ext. <	Val. conc alc. <	Val. ac. tot. <	Addition wine hibrid
2006	36	3	2	1	-	-	1
2007	33	5	2	2	1	-	-
2008	14	3	1	-	2	-	-
2009	42	6	1	2	2	-	-
2010	18	2	1	-	-	1	-
2011	31	2	1	-	-	-	-
2012	16	1	-	3	-	1	-
2013	34	3	1	1	-	-	-
2014	35	4	-	2	-	-	-
Total	259	29	9	11	5	2	1

In terms of unpermitted additions, unfortunately, wine along with many other types of food, has been the target of forger acts.

Of the 259 wine samples analyzed it was found that 43 were subjected to falsifications.

The fraudulent practices met in wines subjected to analyses during 2006-2014 were: citric acid addition - 13 samples, water and ethanol addition - 7 samples, sweeteners addition 6 samples, colorants addition - 6 samples, water addition - 6 samples, ethanol addition - 3 samples, water, ethanol and sweeteners addition - 2 samples.

The addition of water, ethanol or of water and ethanol was identified through isotopic analysis. At a total of 18 samples, from the 259 taken during 2006-2014, isotopic values ¹⁸O indicated the presence of exogenous water and ¹³C values indicated the presence of ethanol from a source other than the one obtained from natural fermentation of grape juice (Table 4).

Table 4

The situation of wine samples identified with different unpermitted additions

Year	Total collected	Total fraud samples	No. of samples with detected additions that are not allowed (falsified)						
			Colorsants addition	Sugar addition	Citic acid addition	Water addition	Etanol addition	Water end etanol addition	Sugar, water end etanol addition
2006	36	14	4	1	7	2	-	-	-
2007	33	2	-	-	2	-	-	-	-
2008	14	-	-	-	-	-	-	-	-
2009	42	6	-	4	1	1	-	-	-
2010	18	1	-	-	1	-	-	-	-
2011	31	-	-	-	-	-	-	-	-
2012	16	2	-	-	2	-	-	-	-
2013	34	11	1	-	-	1	3	6	-
2014	35	7	1	1	-	2	-	1	2
Total	259	43	6	6	13	6	3	7	2

The addition of colorants manifested more intensely in 2006 when 4 samples were discovered and during 2013 - 2014 when the highlight made using the official wool test method led to the discovery of another 2 wine samples with addition of synthetic colorants, one in 2013 and one in 2014.

During the 9-year study was found that the number of samples from counterfeited bottled wine is double compared to the samples from counterfeited bulk wine (Fig. 2).

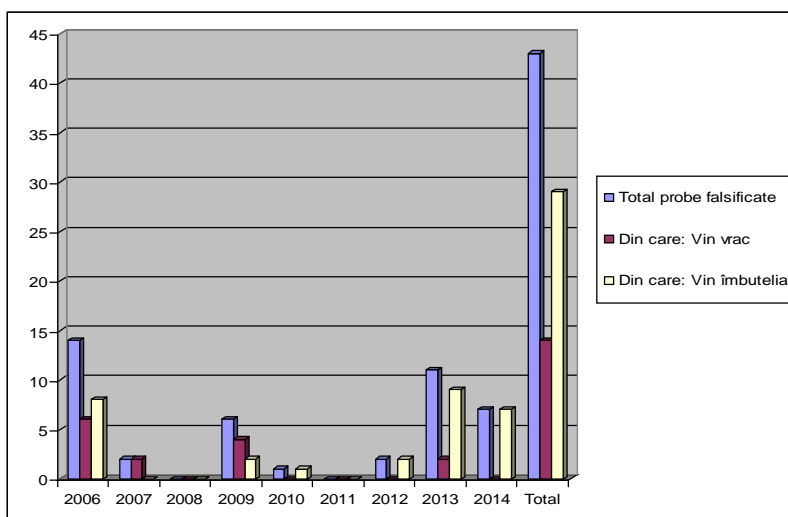


Fig. 2 The situation of wine samples identified as falsified depending on packing manner

The study showed that the forgeries were made almost as much to white wines and red/rose wines (Table 5).

Table 5

Wine sample situation detected counterfeit depending on color

Year	Taken samples	Forged samples	From which	
			White wine	Red/rose wine
2006	36	14	7	7
2007	33	2	1	1
2008	14	-	-	-
2009	42	6	4	2
2010	18	1	1	
2011	31	-	-	-
2012	16	2	-	2
2013	34	11	1	10
2014	35	7	1	6
Total	259	43	15	18

From 43 samples of counterfeit/forged wine, it was found a greater number of fraud related to the dry wines 25 samples, followed by demi-dry wine 12 samples and 6 samples of semi-soft wine (Table 6).

Table 6

Wine sample situation detected counterfeit depending on sugar content

Year	Samples no	Forged samples	From which		
			Dry wine	Semi-dry wine	Semi soft wine
2006	36	14	9	4	1
2007	33	2	-	-	2
2008	14	-	-	-	-
2009	42	6	2	2	2
2010	18	1	-	1	-
2011	31	-	-	-	-
2012	16	2	1	1	-
2013	34	11	8	2	1
2014	35	7	5	2	-
Total	259	43	25	12	6

In terms of unpermitted additions, unfortunately, wine along with many other types of food, has been the target of forger acts.

The distribution of the 45 samples of counterfeit wine, in the nine years of study, according to the origin of county of the producer or bottler, it highlights Dolj county and Vrancea county with 10 and 8 samples wine, followed very close by Tulcea, 5 samples (Table 7).

Counterfeit wine samples produced and/or bottled in one county are coming from one or several manufacturers.

Table 7

Wine samples distribution detected counterfeit according to the origin county

Year	Taken samples	Counterfeit samples	From which:									
			Bac u County	Buz u County	Dolj County	Tulcea County	Vrancea County	Gala i County	Constant a County	R. Moldov a	Itali a	R. Bulgari a
2006	36	14	1	-	3	3	6	-	-	1	-	-
2007	33	2	-	-	1	-	1	-	-	-	-	-
2008	14	-	-	-	-	-	-	-	-	-	-	-
2009	42	6	-	-	4	2	-	-	-	-	-	-
2010	18	1	-	-	-	-	-	1	-	-	-	-
2011	31	-	-	-	-	-	-	-	-	-	-	-
2012	16	2	-	2	-	-	-	-	-	-	-	-
2013	34	11	-	2	2	-	1	-	-	-	1	5
2014	35	7	-	1	-	-	-	-	1	-	-	5
Total	259	43	1	5	10	5	8	1	1	1	1	10

CONCLUSIONS

Unhappily, wine, as almost all the products intended for commerce, was the target of actions of falsification and counterfeit.

After the analysis of the 259 wine samples from the organoleptic, physical and chemical points of view, we identified deviations from the current legal provisions with a number of 100 samples, these representing 38% of all the analysed samples.

Of the 257 wine samples 43 samples had forbidden additions, their percent being of about 16.

Among the most frequent fraudulent practices used in commercialized wines in Dolj County are: the addition of citric acid over the maximum limit – 13 samples, the addition of natural or artificial sweeteners – 6 samples, the addition of coloured substances – 6 samples and the addition of water - 6 samples, with addition of etanol - 3 samples and the addition of water, etanol end sweeteners – 2 samples.

The counties with most falsified wines are: Dolj, Vrancea and Tulcea, which also have the widest areas of vineyard.

The analysis of wines in the commercial network, performed during the study, i.e. during 2006-2012, showed a progressive reduction in the number of counterfeit wine samples by 2012 (Vladu Cristina – Emanuela, 2013).

During 2013-2014 there is an alarming increase of counterfeited wines on the market, mostly coming from the Republic of Bulgaria.

The risk of wine counterfeit/substitution could be eliminated if the Romanian consumer would acquire a minimum knowledge of appreciating wine, and producers, bottlers, dealers and control bodies alike would acquire the culture of discipline at work, and also rigor and need for compliance.

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