

Heavy Metals in Packagings - Check Analyses 1999

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Contents

1	Introduction	3
2	Procedure	4
2.1	Purchase	
2.2	Analyses	
3	Results	5
4	Conclusion	7

Enclosures

I	Registration of Samples	8
	A. Registration of Samples of Wine Bottles	
	B. Places of Purchase of Wine Bottles in Copenhagen City	
II	Enclosure from Purchase	10

1 Introduction

In 1997 the Danish Environmental Protection Agency published the report entitled: Survey of the Content of Heavy Metal in Packagings on the Danish Market, Environmental Project No. 349.

At the end of 1998 - to follow up on this project - the Danish Environmental Protection Agency had requested an analysis of a number of bottle and metal packagings for the content of the heavy metals chromium, lead, cadmium and mercury.

In this investigation the threshold limit of 600 ppm was exceeded for one bottle, and the coming threshold limit of 250 ppm was exceeded for eight bottles.

At the end of 1999 the threshold limit of 250 ppm is in effect. To follow the situation, the Danish Environmental Protection Agency has requested an analysis of fifty bottle packagings for content of the four heavy metals.

2 Procedure

2.1 Purchase

The packagings were purchased in the City of Copenhagen on 1 December, 1999 by Birgitte Kjær, the Danish Environmental Protection Agency, and Ivan Christensen, Danish Technological Institute, Aarhus.

Fifty packagings in the form of wine bottles at a price of DKK 17-100 were purchased.

Two wines were bottled in Denmark whereas the rest of the wines were imported on bottles. Wine bottles imported from Argentina, Bulgaria, France, Greece, Italy, Mexico, Portugal, Spain, Germany and Hungary were purchased.

Place of purchase, country of origin and mark of the 50 samples appear from enclosures I and II.

2.2 Analyses

The analyses for the content of the heavy metals chromium, lead, cadmium and mercury were carried out as described in project 349. The wine bottles were crushed. After crushing of the glass, a pellet was pressed of the glass powder and analysed by X-ray technique (Philips PW2400/UNIQUANT, ver. 4.14).

3 Results

Sample No.	ppm Cr	ppm Cd	ppm Hg	ppm Pb
1	1500	< 10	< 10	28
2	1500	< 10	< 10	170
3	1400	< 10	< 10	140
4	1200	< 10	< 10	150
5	1100	< 10	< 10	350
6	1500	< 10	< 10	150
7	1200	< 10	< 10	250
8	45	< 10	< 10	70
9	1500	< 10	< 10	110
10	1400	< 10	< 10	73
11	250	< 10	< 10	65
12	1900	< 10	< 10	190
13	1200	< 10	< 10	180
14	1300	< 10	< 10	200
15	600	< 10	< 10	130
16	1100	< 10	< 10	300
17	1300	< 10	< 10	200
18	1300	< 10	< 10	260
19	1100	< 10	< 10	180
20	630	< 10	< 10	450
21	730	< 10	< 10	290
22	630	< 10	< 10	340
23	1200	< 10	< 10	110
24	850	< 10	< 10	320
25	1400	< 10	< 10	620
26	960	< 10	< 10	320
27	350	< 10	< 10	42
28	970	< 10	< 10	280
29	460	< 10	< 10	170
30	870	< 10	< 10	280
31	680	< 10	< 10	280
32	1200	< 10	< 10	210
33	1500	< 10	< 10	160
34	1000	< 10	< 10	56
35	1500	< 10	< 10	48

Sample No.	ppm Cr	ppm Cd	ppm Hg	ppm Pb
36	620	< 10	< 10	74
37	280	< 10	< 10	130
38	16	< 10	< 10	35
39	35	< 10	< 10	240
40	46	< 10	< 10	65
41	1100	< 10	< 10	570
42	3300	< 10	< 10	120
43	1200	< 10	< 10	280
44	590	< 10	< 10	160
45	1000	< 10	< 10	220
46	1500	< 10	< 10	220
47	1300	< 10	< 10	120
48	600	< 10	< 10	330
49	72	< 10	< 10	57
50	1000	< 10	< 10	27

The results are average values of double determinations by X-ray technique.
Precision: $\pm 1\%$ rel.

4 Conclusion

To follow up on project 349 of the Danish Environmental Protection Agency: Survey of the Content of Heavy Metal in Packagings on the Danish Market 50 glass packagings have been analysed.

In the Packaging Directive (94/62) threshold limit values for the sum of the concentration levels of lead, cadmium, mercury and hexavalent chromium have been laid down.

During the period from 30 June 1999 to 30 June 2001, the sum of the concentrations of the 4 heavy metals must not exceed 250 ppm.

From 30 June 2001 the threshold limit value is 100 ppm.

The threshold limit value of 250 ppm is exceeded in 15 cases.

The coming threshold limit value of 100 ppm is exceeded in 38 cases.

The exceeding of the threshold limit values has merely been assessed on the basis of the lead content. The values found for chromium is the total content of which the share of Cr(VI) is low.

Enclosure I

A. Registration of Samples of Wine Bottles

Sample No.	Origin	Mark	Type of Wine	Place of purchase
1	Portugal	Charamba, 96	Red	N
2	Portugal	Periquita, 96	Red	N
3	Portugal	Matteus Signature, 96	Red	N
4	Portugal	Aveleda, Vino Verde, 99	White	N
5	Argentina	Santa Isabel, 98	Red	N
6	Italy	Chianti, 97	Red	N
7	Italy	Valpolicella Lamberti, 98	Red	N
8	Italy	Lambrusco Rosé, 99	Sparkling Rose	N
9	Spain	Tres Torres, 98	Red	N
10	Spain	Castillo de Moral, 95	Red	N
11	Germany	Liebfraumilch, 98	White	N
12	France	Jeanne d'Arc, table	Red	N
13	Portugal	Tabor Dao, 96	Red	I
14	Portugal	Tabor Bairrada, 97	Red	I
15	Argentina	La Campana, Mabec, 97	Red	I
16	Argentina	Canciller, 95	Red	I
17	Italy	Montepulciano D'abruzzo, 96	Red	I
18	Italy	Salice Salentino, 96	Red	I
19	Italy	Montefalco Roso, 97	Red	I
20	Italy	Fattoria Sorestro, 98	Red	I
21	Italy	Cabernet Veneto, 98	Red/ecological	I
22	Italy	Villa Nanni, 97	Red	I
23	Italy	Coppertino, 97	Red	I
24	Italy	Bardilino Classico, 98	Red	I
25	Portugal	Port Antino	Port	V
26	Argentina	Malbec Dolium, 98	Red	V
27	Argentina	Church Road, 96	White	V
28	Italy	Colle Moresco, 96	Red	V
29	Italy	Fiulot, Barbera d'Asti, 97	Red	V
30	Italy	Cadei Frati, 96	White	V
31	Italy	Pagus di Montecchia, 97	½ White	V
32	Portugal	Matteus	White	S

Sample No.	Origin	Mark	Type of Wine	Place of purchase
33	Portugal	Porta Nora, Vino Verde, 99	White	S
34	Portugal	Bairrada Primevera, 96	Red	S
35	Portugal	Terras da Beira, 92	Red	S
36	Portugal	Coroa D'ouro, 96	Red	S
37	Argentina	Santa Ana, 98	White	S
38 *	Italy	Castello Romani	White	S
39	Italy	Verdi Spumanti	Sparkling White	S
40	Italy	Lambrusco di Modena Rosato	Sparkling Rose	S
41	Spain	Mundo de Vuntero, 98	Red/ecological	S
42	Germany	Black Tower, 98	White	S
43	Greece	Nemea, 94	Red	S
44 *	Chile	Atacama	Red	S
45	Mexico	Merlot X-A, Domeco, 96	Red	S
46	Hungary	St. Stephens Crown, 98	Red	S
47	Portugal	Garra Feira Talisma, 90	Red	F
48	Italy	Verdicchio d.C.d.J, 98	White	F
49	Germany	Franz Reh Kabinett, 98	White	F
50	Bulgaria	Plovdiv Cabernet, 95	Red	F

*) Imported and bottled by International Wine Cellars, Danmark

B. Places of Purchase of Wine Bottles in Copenhagen City

N: NETTO, St. Kongensgade 47

I : IRMA, Torvegade 58

V : St. Kongensgades Vinhandel

S : SUPER BRUGSEN, Borgergade 28

F : FAKTA, Borgergade 27

Enclosure II – Relating to Purchase