

CORRECTION

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# Correction: Determination of metal ion content of beverages and estimation of target hazard quotients: a comparative study

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## Abstract

This is a correction to the following paper: Hague T, Petroczi A, Andrews PR, Barker J, Naughton DP: Determination of metal ion content of beverages and estimation of target hazard quotients: a comparative study. *Chem Central J* 2008, 2:13.

## Correction

During preparation of a subsequent paper, we observed a computational error in the Target Hazard Quotients (THQ) listed in this work which have been inadvertently overestimated [1]. The overall results and conclusion of our paper with the corrected figures have remained valid. Corrections for Figures three, four and five; and Additional file three are given below in tabular form. The correct values with EFr = 365 days,  $ED_{\text{tot-male}} = 63.9$  years and  $ED_{\text{tot-female}} = 66.7$  years;  $BW_{\text{male}} = 83.11$  kg,  $BW_{\text{female}} = 69.81$  kg, AT = 6 years and 30 years (non-carcinogenic) are shown in Tables 3 and 4. In keeping with the conclusion published, THQ values of apple juice and stout have remained below 1 (Tables 1 and 2), whereas the combined THQ values for red wine

(both intact and ultrafiltered) have exceeded the cutoff value of 1, mainly owing to high V values (Tables 3 and 4). Although in keeping with the literature, THQ values were calculated for AT = 30 years, given the effect metals are assumed to have on health and delayed onset, AT is likely to be below 30 years.

As noted in the paper, the THQ values calculated are concerning in that they are mainly above the safe level of  $THQ \leq 1$ , which premise holds for the wine with the adjusted THQ values. It must be emphasized that the THQ value is to be judged as either below or above 1, where any value above 1 is a cause for health concern. It is notable that i) choices in value input into averaging time (AT), ii) uncertainty factor regarding the oral reference dose (RfD) and iii) bioavailability can have signifi-

**Table 1 Corrected THQ values for apple juice and stout (AT = 6 years)**

Metal	THQ apple juice (male)	THQ apple juice (female)	THQ stout (male)	THQ Stout (female)
V	0.0092	0.0114	0.0365	0.0434
Cr *	0.0046	0.0057	0.0039	0.0046
Mn *	0.0690	0.0858	0.0278	0.0331
Ni	0.0103	0.0128	0.0006	0.0007
Cu	0.0313	0.0389	0.0089	0.0106
Zn	0.0111	0.0138	0.0025	0.0030
Pb	0.0000	0.0000	0.0000	0.0000
$\Sigma$	0.1355	0.1684	0.0802	0.0955

\* above working range

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**Table 2 Corrected THQ values for apple juice and stout (AT = 30 years)**

Metal	THQ apple juice (male)	THQ apple juice (female)	THQ stout (male)	THQ Stout (female)
V	0.0018	0.0023	0.0073	0.0087
Cr *	0.0009	0.0011	0.0008	0.0009
Mn *	0.0138	0.0172	0.0056	0.0066
Ni	0.0021	0.0026	0.0001	0.0001
Cu	0.0063	0.0078	0.0018	0.0021
Zn	0.0022	0.0028	0.0005	0.0006
Pb	0.0000	0.0000	0.0000	0.0000
Σ	0.0271	0.0337	0.0160	0.0191

**Table 3 Corrected THQ values for intact and ultrafiltered red wine (AT = 6 years)**

Metal	THQ intact (male)	THQ Intact (female)	THQ ultrafiltered (male)	THQ ultrafiltered (female)
V	4.5114	5.6063	4.0552	5.0393
Cr *	0.0213	0.0265	0.0241	0.0300
Mn *	0.5620	0.6984	0.5454	0.6778
Ni	0.0496	0.0617	0.0422	0.0525
Cu	0.2429	0.3018	0.0189	0.0234
Zn	0.1250	0.1553	0.1258	0.1564
Pb	0.0001	0.0002	0.0000	0.0000
Σ	5.5125	6.8502	4.8117	5.9794

**Table 4 Corrected THQ values for intact and ultrafiltered red wine (AT = 30 years)**

Metal	THQ intact (male)	THQ Intact (female)	THQ ultrafiltered (male)	THQ ultrafiltered (female)
V	0.9023	1.1213	0.8110	1.0079
Cr *	0.0043	0.0053	0.0048	0.0060
Mn *	0.1124	0.1397	0.1091	0.1356
Ni	0.0099	0.0123	0.0084	0.0105
Cu	0.0486	0.0604	0.0038	0.0047
Zn	0.0250	0.0311	0.0252	0.0313
Pb	0.0000	0.0000	0.0000	0.0000
Σ	1.1025	1.3700	0.9623	1.1959

\* above working range

cant effect on the THQ value. The THQ is designed to be a conservative estimate. However, further research is required in order to provide guidance on appropriate value choices.

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#### Competing interests

The authors declare that they have no competing interests.

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#### References

1. Hague T, Petroczi A, Andrews PR, Barker J, Naughton DP: Determination of metal ion content of beverages and estimation of target hazard quotients: a comparative study. *Chem Central J* 2008, **2**:13.

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