

Abstract

Total SO₂ Content and Health Risks Associated with Serbian Orange Wines [†]

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Abstract: Orange wine is a wine obtained via the vinification of white grapes in a similar way to making red wine, so the fermenting juice spends time macerating in contact with the grape skins, affecting the color and structure of the final wine. Sulfur dioxide (SO₂) is the primary preservative used in wine. At wine pH, the most abundant forms are molecular SO₂, responsible for the antioxidant and antimicrobial effects, and bisulfite. This study was conducted to determine the levels of total SO₂ in orange wines marketed in Serbia and to assess the risk of SO₂ exposure through wines. Twenty-four orange wines were subjected to the volumetric analysis of total SO₂. Health risks were assessed taking into account wine consumption regarding the population average, for regular drinkers only and chronic heavy drinkers, according to the World Health Organization data, as well as the Serbian Food Consumption Survey. The content of total SO₂ varied from 10.8 to 79.4 mg/kg, and there were no products exceeding 200 mg/kg, which is the regulated level in Serbia. A risk assessment was conducted according to the position of the European Food Safety Authority that the available toxicity database was inadequate to derive a group acceptable daily intake (the previous temporary ADI was 70 mg SO₂ equivalents/kg bw per day) and that a margin of exposure (MOE) approach should be used instead. The MOE was calculated as the ratio of a lower confidence limit of the benchmark dose of 38 mg SO₂ equivalents/kg bw per day, which was based on prolonged visual evoked potential latency, and used to estimate the exposure of men, women and both sexes. The resulting MOEs, evaluated by applying an assessment factor of 80, indicated no risk concern in any of the exposure scenarios. Minimum MOE values were obtained for males in the consumers-only scenario (1061 and 357 for the mean and high (last quartile mean) exposure levels, respectively). Although encouraging, the findings of this study should be interpreted considering that SO₂ could be used in various food products and that only an aggregate exposure (accounting for all exposure sources) could fully reveal the associated health risks.

Keywords: food safety; food additives; margin of exposure; risk assessment



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