TEF-5

Programme & Book of Abstracts

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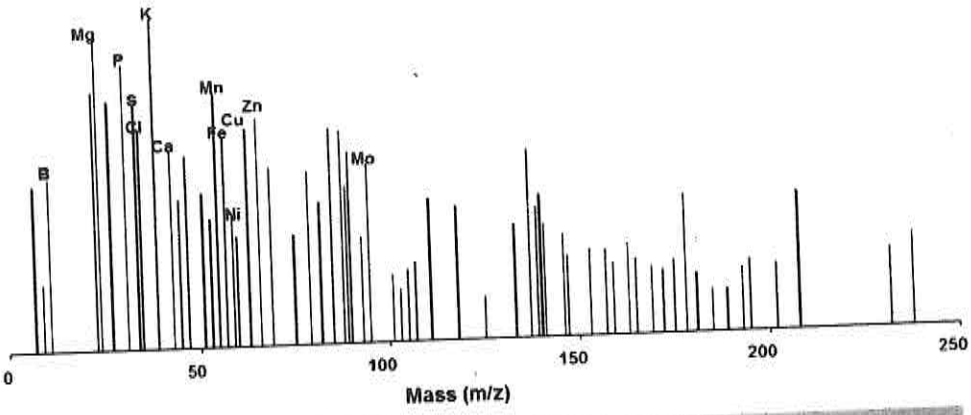

DTU Food
National Food Institute

Copper median concentration (1.45 mg/kg) was lower than data reported in bibliography on rice sampled in Italy (5.8 mg/kg). Aluminium concentration ranged from 5.5 mg/kg to 80.78 mg/kg, with a median value of 19.51 mg/kg; comparisons against aluminium concentration in rice in Europe were not possible, lacking data for this element in European rice in literature.

P7.

CADMIUM IN THE SOIL-VINE-GRAPE SYSTEM

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Because of its chemical properties and in contrast with other metals, Cadmium (Cd) is often present in soil in easily available forms and can thus accumulate in plants and in the food chain. Its presence may be of great concern, as it is classified as a carcinogen by the International Agency for Research on Cancer. The aim of this study was to monitor the Cd content in grapes, vine leaves and in the respective cultivation soil and to investigate the ability of soil analysis to estimate the Cd content in grapes.
Grapes (N=18) and leaves (N=18) were sampled at harvest time in 11 different areas of Trentino (North-East Italy). The samples were washed, ground and acid digested before Cd determination.

Soil (N=11) was collected in the same vineyards in spring before fertilisation treatments, dried, sieved (<2mm) and ground (<0.5mm). Cd extraction was performed with different soil extractants: aqua regia, DTPA 0.005M, citric acid 0.1mM, ammonium acetate 1M and ammonium nitrate 1M. All digested or extracted samples were analysed using ICP-MS for Cd quantification.
The Cd content in grapes varied between 0.02 and 0.12 µg/kg fresh weight, more than 100 times lower than the legal limit set for fruit (EC 1881/06 Regulations and subsequent modifications, 0.05 mg/kg f.w.).
A statistically significant relationship between the Cd content in berries, leaves and soil extracted using DTPA or citric acid was shown.

P8.

Arsenic in wines: the effect of yeast strain and winemaking practices

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Given the carcinogenic potential of arsenic (As) and the recommendations of the World Health Organisation regarding the need to control and reduce the arsenic content in food and beverages, this research aims to investigate As content in must and wine and to study winemaking practices that can affect and reduce its presence in the final product.
Starting from grapes (n=7) with a naturally high As content, because grown on geologically rich soils, white wines were produced using 10 different commercial yeast strains. The same grapes were also fermented using one of the yeast strains, with skin-contact during fermentation to obtain a red wine.
Total As was analysed after dilution using ICP-MS.
As content in wines (N= 77, min-average-max 0.09-0.71-1.51 µg/L) was always lower than the limit suggested by OIV, being 200 µg/L.
Different yeast showed a significantly different capability to reduce As during fermentation, with a reduction from juice to wine ranging between 45 and 92% (67-82%, if we consider the mean of each strain).
The 7 red wines, with levels varying from 0.31 to 1.51 µg/L, had a significantly higher As content than the 7 respective whites (0.12-0.96 µg/L).

To check the effect of As concentration on fermentation time course, grape juice was spiked with 0, 5, 10, 500 and 1000 µg/L of As before yeast addition and the weight decrease was monitored during fermentation. All yeast strains completed the fermentation without significant differences and neither stuck nor lengthening fermentation were observed, even with As content of 1 mg/L in grape juice.