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SEASONAL VARIATION OF AFLATOXIN M1 IN RAW MILK FROM VOJVODINA, SERBIA

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• Introduction

Aflatoxin M1 (AFM1) is a toxic metabolite of aflatoxin B1 that is excreted in the milk of animals that have consumed contaminated feed. It poses a persistent threat to human health because of its thermal stability. Maximum permitted levels of this toxin in EU are 0.050 µg/kg and 0.250 µg/kg in Serbia. The aim of this study was to investigate seasonal variation in the occurrence of AFM1 in raw milk samples.

• Material and method

A total of 244 raw milk samples were collected between October 2025 and October 2026 from various farms within AP Vojvodina. The samples were tested for the presence of AFM1 using the Enzyme-Linked Immunosorbent Assay (ELISA) method , a microplate reader (BioTek, USA) and a Veratox® AFM1 test kit (Neogen, USA). The limit of quantification was 0.005 µg/kg. Data were analyzed by one-way ANOVA, followed by Duncan's post-hoc test ($p<0.05$).

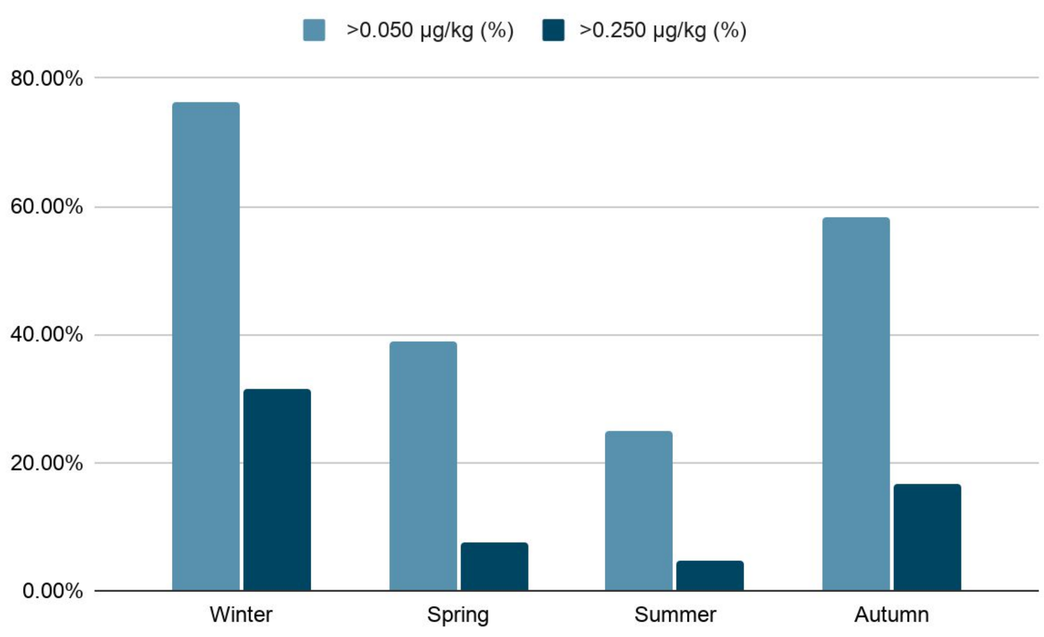


Figure 1. Percentage of samples exceeding EU and Serbian limits, per season.

• Results and discussions

Concentrations of AFM1 ranged from 0.005 µg/kg to 0.817 µg/kg, with an average concentration of 0.121 µg/kg. The EU limit was exceeded by 124 (50.82%) of the samples, while 40 (16.39%) samples exceeded the Serbian regulation.

Season had a significant effect on AFM1 levels (ANOVA, $p<0.001$). Post-hoc analysis showed that the levels of AFM1 were significantly higher in winter samples (0.206 µg/kg) and significantly lower in summer samples (0.043 µg/kg) (Figure 2).

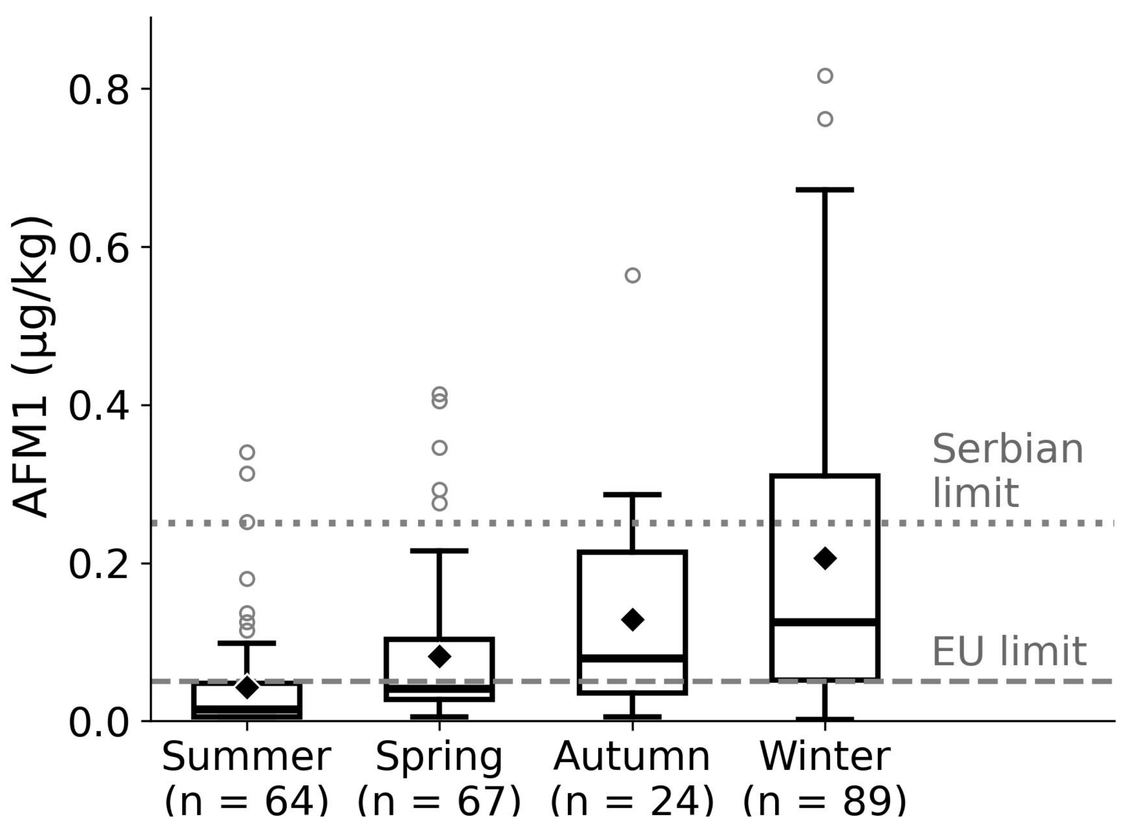


Figure 2. AFM1 in raw milk by season (line = median, diamond = mean).

• Conclusions

These findings highlight the need for improved control of AFB1 in dairy cattle feed, good agricultural and storage practices, as well as regular milk monitoring.