Ss. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE
FACULTY OF VETERINARY MEDICINE - SKOPJE

BOOK OF ABSTRACTS

9th International Scientific Meeting Days of Veterinary Medicine 2022

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R. of North Macedonia

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VALIDATION PROTOCOL FOR DETERMINATION OF FUMONISINS IN CORN

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Fumonisins are a group of at least 15 closely related mycotoxins produced principally by *Fusarium verticillioides* and *Fusarium proliferatum*. Fumonisin B_1 is the most frequently found in food products (especially corn) representing 70–80% of the total of fumonisin content and, together with FB_2 and FB_3, seem to be the major fumonisin due to its toxic properties. It is most important in veterinary medicine as a cause of leukoencephalomalacia in horses, liver cancer in rats, and porcine pulmonary edema. In areas of high maize consumption fumonisins may be responsible for esophageal cancer in humans. FB_1 is classified as possibly carcinogenic to humans (IARC group 2B). As an animal and human health threat, fumonisins are regulated by legislation worldwide. Maximum limits for the total content of fumonisins have been established in the EU in maize and maize based products (EC No 1126/2007). Among various analytical methods for the determination of mycotoxins, ELISA method is still the method of choice for screening purposes. The aim of this paper was to test and validate a commercial ELISA kit for determination of fumonisins. The validation procedure was performed in compliance with Commission Decision 2002/657/EC. For linearity test, six standard solutions were used in a concentration range of 0 – 2 mg/kg and a satisfactory coefficient of correlation was found. The LOD was accomplished from the measurement of the background response from 20 blank corn samples and it was found to be 50 µg/kg. The determination of trueness was performed by means of an analysis of six replicates of the CRM and the obtained value was 83.5%. Recovery, the other accuracy parameter, was achieved by fortifying blank samples at level of one-half of MRL and the obtained value was 112.6%. The both values (trueness and recovery) were in accordance to the performance criteria. CCβ was established by analyzing at least 20 blank samples fortified at level one-half of MRL and the achieved value was 0.63 ± 0.31 mg/kg. Repeatability was estimated using the data from the recovery and the RSD_r was 17.33%. The within-laboratory reproducibility (RSD_R) of the method was 27.8% which is in accordance to the EU validation criteria. The realised validation protocol shows that this rapid ELISA method is simple, because it employs staff with lesser technical training; easier, it saves time and costs, saves investments in complex instruments and it is accurate. It can be implemented for routine analysis of fumonisins.

Key words: validation, ELISA, fumonisins, corn