

TITLE: MYCOTOXINS EVALUATION IN DIFFERENT WHEAT GRAINS MATURATION STAGES

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ABSTRACT:

Among the *Fusarium* toxins found in grains, especially in wheat, the most predominant is deoxynivalenol (DON), from trichothecenes type B group. The main producers of DON are *F. graminearum*, *F. culmorum*, and *F. cerealis*. These fungi are soil fungi and are important plant pathogens that grow on the crop in the field. The occurrence of these metabolites depends on the fungi growth and can occur during the cultivation, harvest and grain storage. These mycotoxins are highly stable during storage and food processing, persisting until the final product. There are several consequences by the mycotoxicological contamination that should be mentioned, such as, direct loss of agricultural products, reduction of the nutritional value of products, animal diseases, damage to human health and extensive economic issues. For these reasons, the aim of the present study is to evaluate DON presence in different stages of wheat grains maturation [flowering (1), maturation (2) and harvest (3)]. To accomplish mycotoxin analyzes, detection and quantification were carried out in a LC-MS/MS system. This method was successfully validated and linearity was confirmed by a six point calibration curve ranging from 200 to 4000 µg/Kg with a coefficient correlation of $r^2=0.9992$. The limits of detection and quantification were set at 200 µg/Kg and 20 µg/Kg, respectively. The levels found for DON in the first stage varied between 35.4 to 2200 µg/Kg. Considering the maturation stage, the levels ranged from 24.3 to 7730 µg/Kg. Finally, the grains in harvest stage showed levels ranging from 68.9 to 3300 µg/Kg. The results obtained were compared to the Brazilian regulation and 20% were above to the maximum levels established. The data found in the present research could be associated with the temperature of the tropical regions where the wheat grains were cultivated in Brazil and also on the presence of fungi potentially producers of these toxins.

Keywords: contamination; cultivation; deoxynivalenol; LC-MS/MS

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