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FUMONISIN B_1 AND DEOXYNIVALENOL CONTAMINATION OF HUNGARIAN MAIZE FLOUR AND CANNED MAIZE SAMPLES

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In an extensive study we measured the deoxynivalenol (DON), zearalenon (ZEA), fumonizin B_1 (FB_1) and fumonizin B_2 (FB_2) contamination of various cereal-based foods. We found that apparently, DON and FB_1 occurred most frequently, most of all in maize flour (Photo 1.) and canned corn (Photo 2.). In this poster we focus on the contamination of samples collected between 2019 and 2021 for these two foodstuffs.

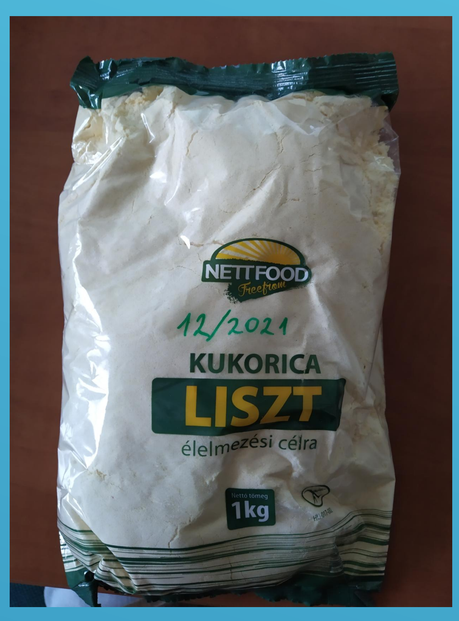


Photo 1.: Maize flour

Photo 2.: Canned corn

FB_1 and DON concentration of maize flour (n=56) and canned maize (n=20) samples commercially available from the shelves of various store chains (Auchan, Tesco, Coop, Spar, Interspar, etc.) were determined by HPLC/MS (High Pressure Liquid Chromatography/ Mass Spectroscopy) method. For FB_1 the Limit of Detection (LOD) was 0.031 mg/kg, the Limit of Quantification (LOQ) was 0.093 mg/kg. For DON the LOD was 0.053 mg/kg, the LOQ was 0.160 mg/kg.

Figure 1.: FB_1 concentration of maize flour samples

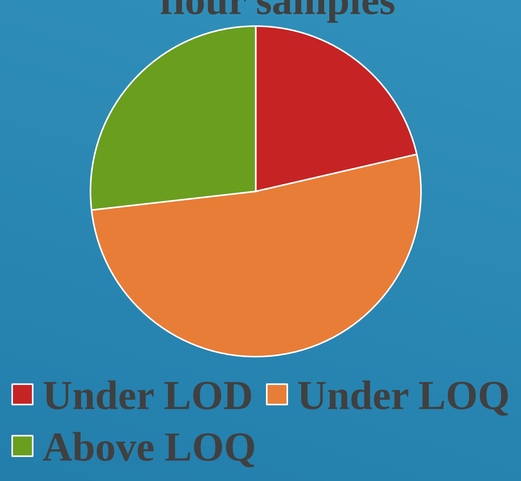
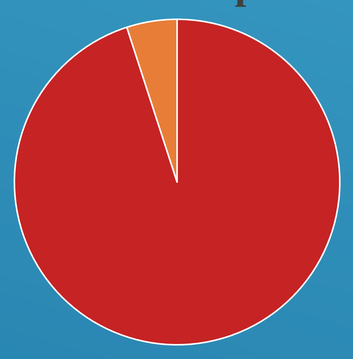


Figure 2.: FB_1 concentration of canned maize samples



In 21.4% of maize flour samples the FB_1 concentration was under LOD, in 51.8% was under LOQ and in 26.8% was above LOQ (Figure 1.), average: 0.189 mg/kg. In 95% of canned maize samples the FB_1 concentration was under LOD and 5% was under LOQ (Figure 2.). According to Commission Regulation (EC) No 1126/2007 the limited value for FB_1+FB_2 is 1 mg/kg in case of maize intended for direct human consumption and maize-based foods for direct human consumption.

In 66% of maize flour samples the DON concentration was under LOD, 32.2% was under LOQ and one sample (0.468 mg/kg) was above LOQ (Figure 3.). In 70% of canned maize samples the DON concentration was under LOD, 25% was under LOQ and one sample (0.257 mg/kg) was above LOQ (Figure 4.). According to Commission Regulation (EC) No 1126/2007 the limited value for DON is 0.75 mg/kg in case of cereals intended for direct human consumption, cereal flour.

Figure 3.: DON concentration of maize flour samples

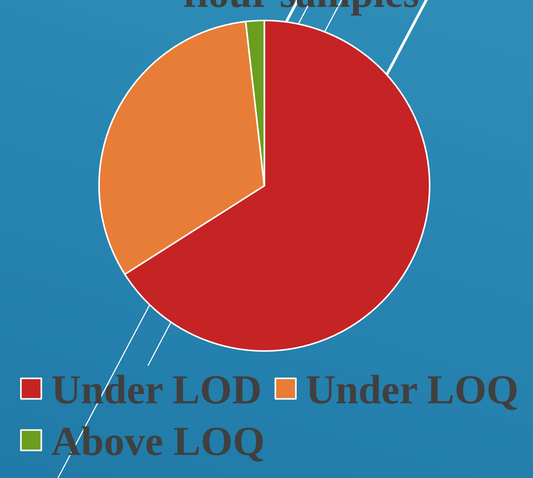
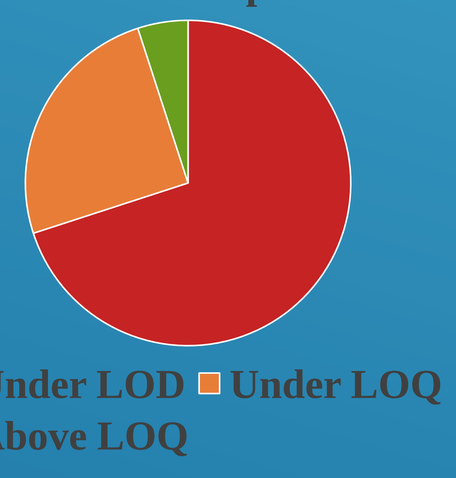


Figure 4.: DON concentration of canned maize samples



Conclusions: 78.6% of maize flour samples was contaminated with FB_1 and 34% was contaminated with DON. Only 5% of canned maize samples was contaminated with FB_1 and 30% was contaminated with DON. The incidence of DON appears to be similar for the two foods, however, there appears to be a difference in the incidence of FB_1. Further investigations are needed to understand the different FB_1 contamination of different maize-based foods. The mycotoxin concentration of the samples we tested did not reach the limited value in any cases.

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