

## Mycotoxins

Mycotoxins are secondary metabolites produced by fungi on agricultural commodities intended for human and animal consumption. These mycotoxins are potentially dangerous to humans and animals since they are, amongst other also carcinogens. Aside from health risks, mycotoxin contamination can also reduce the value of the crops. Environmental factors such as temperature, humidity, soil and storage conditions influence toxin production.

Results published in 2011 of a survey conducted on mycotoxin occurrence in 324 grain, feed and feed commodity samples sourced in the Middle East and Africa included the results of 77 samples from SA. <sup>(1)</sup> Results of the study indicated that the pattern of mycotoxin occurrence depends on where the commodity originated, warmer countries, such as Nigeria, Kenya and Ghana have higher occurrence of aflatoxins, whereas moderate countries, such as SA, exhibit a totally different contamination pattern, with a higher prevalence of B-trichothecenes (including deoxynivalenol, nivalenol and acetyl-deoxynivalenol).

In the results published, the main contaminants in the SA samples were deoxynivalenol (DON), fumonisin (FUM) and zearalenone (ZON) and a wheat sample from South Africa presented the highest contamination level of all the samples analysed for both DON (11 022 µg/kg) and aflatoxin B<sub>1</sub> (7 µg/kg). The level of DON is above the European Commission guidance value.

SAGL implements a multi-mycotoxin screening method using UPLC-MS/MS. With this technique simultaneous quantification and confirmation of Aflatoxin G<sub>1</sub>; B<sub>1</sub>; G<sub>2</sub>; B<sub>2</sub>, Fumonisin B<sub>1</sub>; B<sub>2</sub>; B<sub>3</sub>, Deoxynivalenol, 15-ADON, HT-2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A are possible in one run.

Fourty samples (representing different regions as well as different classes and grades) were selected randomly for mycotoxin analyses.

Ten of the samples tested positive for Deoxynivalenol with levels higher than the limit of quantification (100 µg/kg), averaging 187 µg/kg.

The European Union specifies the following maximum levels for mycotoxins on wheat:

### Aflatoxins

- All cereals and all products derived from cereals, including processed cereal products, with the exception of maize, rice, processed cereal-based foods for infants and young

children and dietary foods for special medical purposes intended specifically for infants, B<sub>1</sub> ≤ 2.0 µg/kg.

- All cereals and all products derived from cereals, including processed cereal products, with the exception of maize, rice, processed cereal-based foods for infants and young children and dietary foods for special medical purposes intended specifically for infants, sum of B<sub>1</sub> + B<sub>2</sub> + G<sub>1</sub> + G<sub>2</sub> ≤ 4.0 µg/kg.

### Ochratoxin A

- Unprocessed cereals, ≤ 5.0 µg/kg.
- All products derived from unprocessed cereals, including processed cereal products and cereals intended for direct human consumption, ≤ 3.0 µg/kg.

### Deoxynivalenol

- Unprocessed cereals other than durum wheat, oats and maize, ≤ 1250 µg/kg.
- Cereals intended for direct human consumption, cereal flour, bran and germ as end product marketed for direct human consumption, with the certain exceptions (see full regulation) ≤ 750 µg/kg.
- Bread (including small bakery wares), pastries, biscuits, cereal snacks and breakfast cereals, ≤ 500 µg/kg.

### Zearalenone

- Unprocessed cereals other than maize ≤ 100 µg/kg.
- Cereals intended for direct human consumption, cereal flour, bran and germ as end product marketed for direct human consumption and the germ with the certain exceptions (see full regulation) ≤ 75 µg/kg.
- Bread (including small bakery wares), pastries, biscuits, cereal snacks and breakfast cereals, excluding maize-snacks and maize-based breakfast cereals, ≤ 50 µg/kg.

1. Rodrigues I., Handl J., and Binder E.M., 2011. Mycotoxin occurrence in commodities, feeds and feed ingredients sourced in the Middle East and Africa. *Food Additives and Contaminants: Part B, Vol 4*, 168 -179.