

## New (old) occupational risk!

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### Introduction

Contrary to fungi, exposure to mycotoxins is not usually identified as a risk factor present in occupational settings. This is probably due to the inexistence of limits regarding concentration of airborne mycotoxins, and also due to the fact that these compounds are rarely monitored in occupational environments (Degen et al., 2011). Aflatoxin B1 (AFB1) is the most prevalent aflatoxin and is associated with carcinogenicity, teratogenicity, genotoxicity and immunotoxicity (IARC, 2013) but only a few studies examined exposure in occupational settings. Workers can be exposed to high airborne levels during certain operations in specific occupational settings.

### Aim of Study

The study aimed to assess exposure to AFB1 in three settings: poultry, swine production and waste management.

### Materials and Methods

A biomarker of internal dose that measures AFB1 in serum was used. For AFB1 quantification, the RIDASCREEN Aflatoxin B1 30/15 enzyme-linked immunosorbent assay (ELISA; R Biopharm) was used, and was calibrated with aflatoxin standards from 1 to 50 ng/ml. 84 workers were enrolled on the study:

- ✓ 34 from poultry farms
- ✓ 11 from swine production farms
- ✓ 40 from waste management industry.

A control group (n = 30) was also considered in order to know the AFB1 background levels for the Portuguese population.



Fig. 1 – ELISA equipment and consumables

### Results and Discussion

Exposure occurs in the three occupational settings with higher results in waste management. In the control group, the AFB1 values were all below 1 ng/ml (LOD).

**Table 1.** Aflatoxin B1 results in workers group (ng/ml)

	Poultry	Swine	Waste Management
Workers with results >LOD	18 (58.6%)	6 (54.5%)	40 (100%)
Range/Median	< LOD to 4.23/1.36	< LOD to 8.9 /1.1	2.5 to 25.9/9.75

The most adequate measure to avoid exposure is the control of mycotoxins presence in the materials that are handled. However it can be a real challenge to restrain this contamination.

In these settings particles are probably acting as a carrier of AFB1 to the workers breathing zone and mouth (Autrup et al., 1993; Brera et al., 2002; Viegas et al., 2013).

Preventing exposure to particles will contribute to reduce exposure to AFB1 (Viegas et al., 2014). Exhaust ventilation and the use of masks are some of the most common preventive measures.

### Conclusions

**Data showed that occupational exposure to AFB1 occurs in those settings with the waste management being the most problematic. Safety measures need to be developed to avoid exposure to this carcinogenic agent.**

### References

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