Introduction

Aflatoxin B$_1$ (AFB$_1$) is one of the most deeply studied mycotoxins and belongs to the group of toxins produced by the genus Aspergillus (A. flavus, A. parasiticus, A. nomius). AFB$_1$ has been classified as a human carcinogen (hepatocellular carcinoma) by the International Agency for Research on Cancer with a sufficient evidence in humans and a strong support that main mechanism is genotoxicity.$^1$

Although many literature exists concerning the ingestion of food contaminated with aflatoxin, there are still few studies regarding mycotoxin inhalation in occupational settings. Since mycotoxins are relatively non-volatile, exposure by inhalation is caused by airborne fungal particulates or fungi-contaminated substrates that contain aflatoxin.$^2$

Aim of the Study

To determine occupational exposure to aflatoxin in Portuguese poultry and swine production.

Materials and methods

- Study was carried out in 7 poultry and 7 swine farms located at the district of Lisbon.
- A total of 19 workers (11 swine; 8 poultry) and 30 controls (administrative) provided blood samples. All subjects were protocol informed and signed a consent form.
- Measurement of AFB$_1$ was performed by ELISA (R-Biopharm).
- Serum samples were treated with pronase (Merck), wash in a Column C18 and purification was made with immunoaffinity columns (R.biopharma), specific for AFB$_1$.
- The assay was calibrated with aflatoxin standards ranging from 1 to 50 ng/ml.
- It was applied statistical test (Mann-Whitney) to verified statistical difference in AFB$_1$ results between the two settings.

Results and Discussion

- **Poultry:** <1-3.67 ng/ml/ Swine: < 1-5.96 ng/ml.
- **Controls:**<1 ng/ml.
- Wasn’t found statistical difference between the two settings.
- Results reveal a tendency for poultry workers have higher aflatoxin values - poultry activities are related with higher exposure to particles.$^3$
- Particles presence probably promotes exposure by inhalation: Brera and colleagues (2002) found aflatoxin in airborne dust.$^4$
- Only women’s in both settings have results <1ng/ml - probably due to differences in the activities: men develop tasks with higher dust exposure and physical effort that lead to higher inhalation rates.
- Inhalation should be consider a route of exposure in both settings - experimental and epidemiological evidences to suggest that the lung is, besides liver, a target for AFB$_1$.$^5$,$^6$,$^7$
- Biomarker data obtained give accurate about exposure - allows a focus on the body burden or the total absorbed dose.$^8$

Conclusions

Results obtained suggest that exposure to AFB$_1$ by inhalation occurs and represents an additional risk in both occupational settings that must be recognized, assessed and prevented.

References