



## **Occupational exposure to aflatoxin (AFB<sub>1</sub>) in poultry production**

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## INTRODUCTION

Aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) has been recognized to cause cancer in the humans liver.

*IARC, 1993*

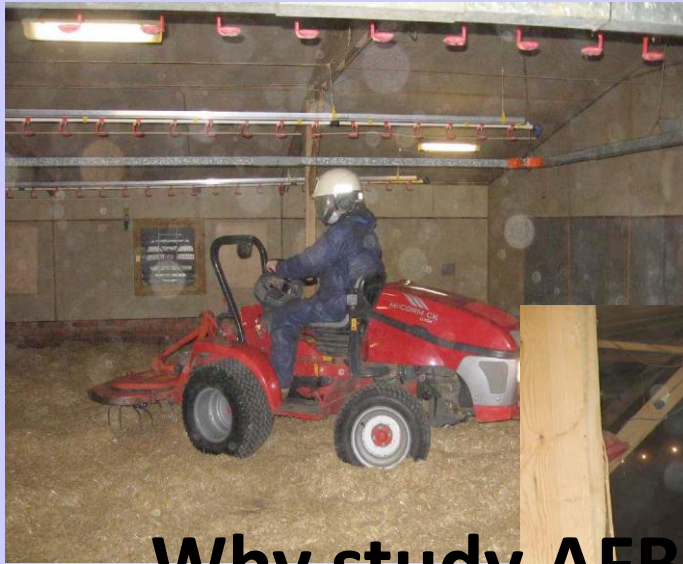
Epidemiological and laboratory evidence also point towards the respiratory system as target for carcinogenesis.

Exposure occurs mainly through food chain but inhalation represent an additional route of exposure.

Agricultural workers have the greatest risk of occupational exposure due to their exposition to airborne aflatoxin through inhalation of dust.

*Flannigan and Gillian, 1996; Ghosh et al., 1997; Brera et al., 2002*





# Why study AFB<sub>1</sub> exposure in poultry setting?

Spreading litter



Populating



Depopulating



Vaccinating



## MATERIALS AND METHODS

### Poultry units

- ✓ 7 farms located at the district of Lisbon;
- ✓ All the units have more than one pavilion;
- ✓ Workers were not using respiratory protection or other kind of protection device;
- ✓ Pavilions with natural and mechanical ventilation but this last resource is generally only activated in summer, when temperature and humidity rises.





## MATERIALS AND METHODS

### Subjects

- ✓ Blood samples were collected from a total of 31 poultry workers from six poultry farms (11 females and 20 males).
- ✓ Control group (n=30) with administrative tasks and without any kind of agricultural activity.
- ✓ All subjects were provided with the protocol and sign a consent form.



## MATERIALS AND METHODS

### ELISA method

- ✓ Samples were treated with pronase (Merck).
- ✓ Wash in a Column C18.
- ✓ Purification made with immunoaffinity columns (R.biopharma), specific for AFB<sub>1</sub>.
- ✓ Calibrated with Aflatoxin standards ranging from 1 to 50 ng/ml.
- ✓ Absorbance was measured at 450 nm and results were assessed with Ridasolf Win software version 1.73 (R®Biopharm).





## RESULTS

- ✓ 18 poultry workers (58.6%) had detectable levels of AFB<sub>1</sub>.
- ✓ Median value of 1.82 ng/ml.
- ✓ AFB<sub>1</sub> was not detected in the serum sampled from any of the individuals used as controls.
- ✓ Poultry workers: not found significant differences (Mann–Whitney test) between subjects of different gender ( $p=0.238$ ).
- ✓ Males subjects have higher AFB<sub>1</sub> values ( $\text{Med}_M=1.11$ ;  $\text{Med}_F < 1$ ).



## MAIN CONCLUSIONS

- ✓ Findings corroborate the hypothesis: *Occupational exposure to AFB<sub>1</sub> by inhalation in poultry production.*
- ✓ Aflatoxin is probably carried to the workers breathing zone by dust.
- ✓ Differences found between genders can be due essentially to differences in the activities and dust exposure associated.





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