

# EFFECT OF MYCOTOXINS ON SWINE IN IMMUNE RESPONSES

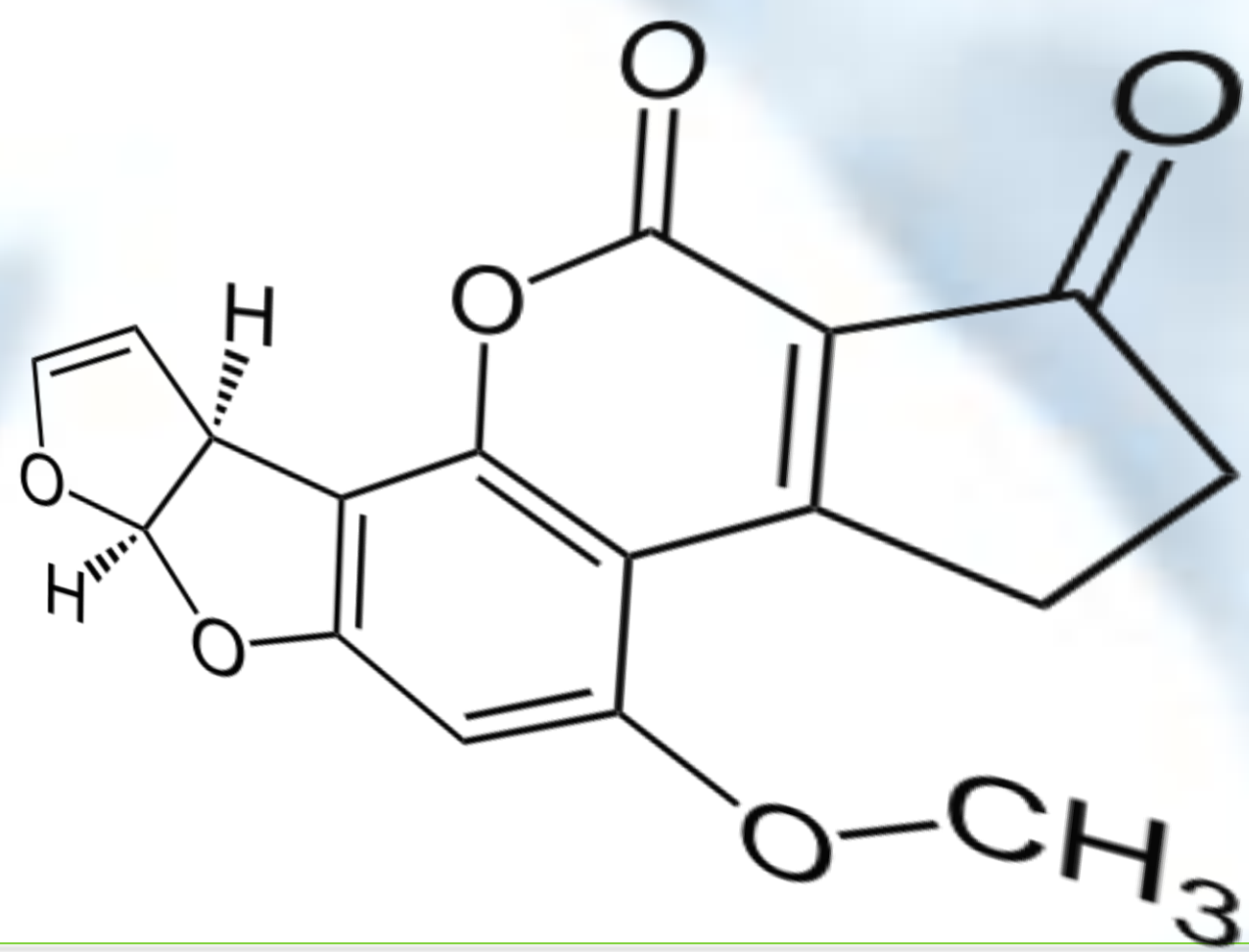
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## INTRODUCTION

Mycotoxins are secondary metabolites of fungi, hazardous to human and animal health. Their effect has been mostly studied in medium or half doses. It has been stated that, at lower, subclinical doses, mycotoxins may alter immune response, thus predisposing the appearance of diseases. Swine are a good model for studying the effect of mycotoxins to extrapolate to humans. This review is focused on the effect of most common mycotoxins on Swine immune response.

### AFLATOXIN BI (AFBI)

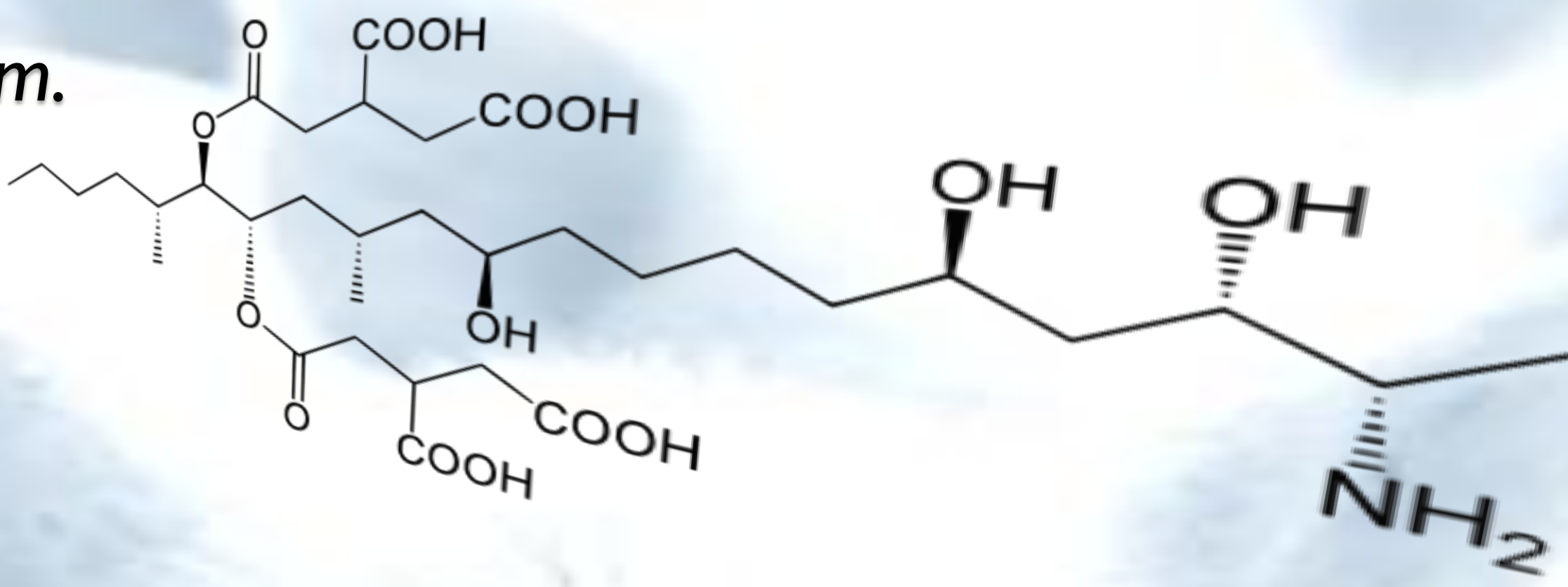
Produced by *Aspergillus flavus* and *A. Parasiticus*



- ✓ High-medium doses: hepatotoxic effect
- ✓ Low levels AFBI → Alter different cells → dendritic cells, T cells, neutrophils and macrophages → ↓ growth, ↓ vaccine protection (alter cytokines and antibodies)

### FUMONISIN BI (FBI)

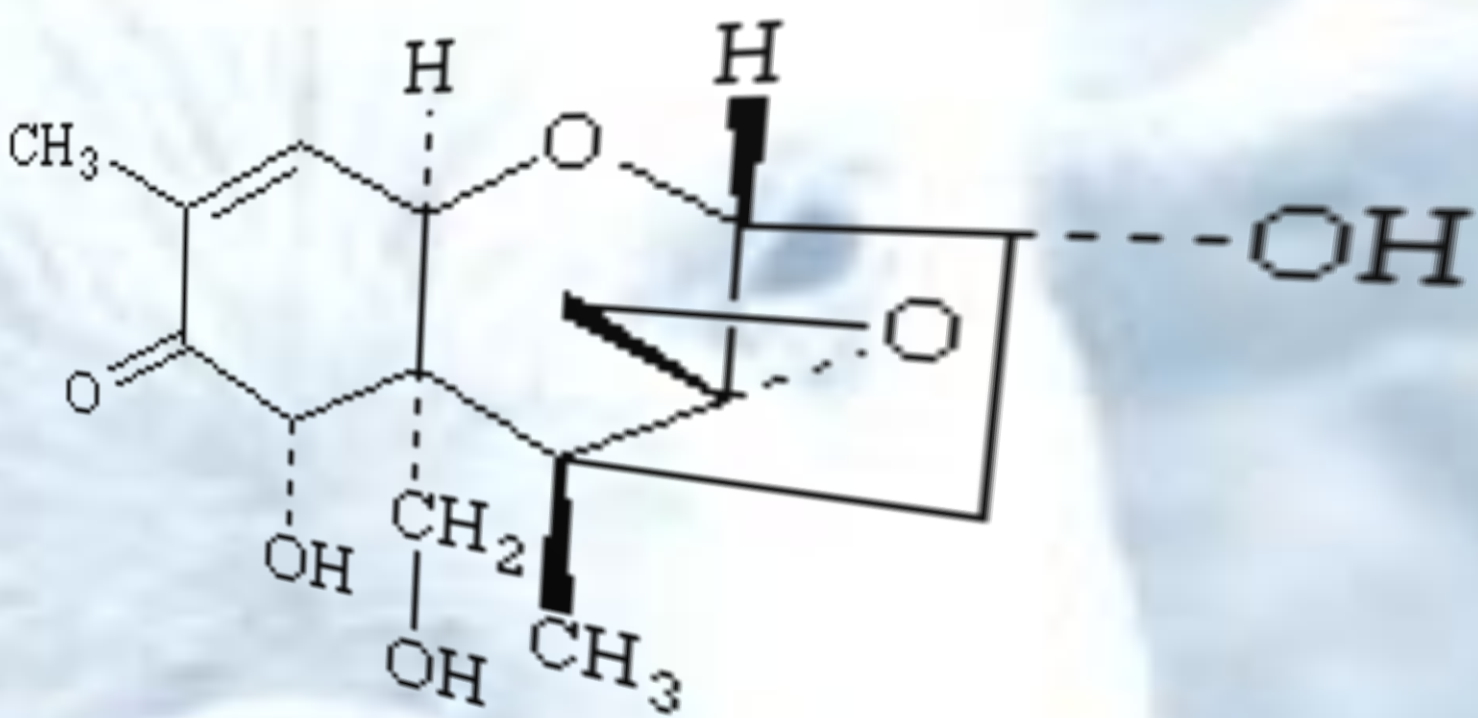
Produced by *Fusarium verticillioides* and *F. Proliferatum*.



- ✓ High-medium doses: different effects depending on species
- ✓ Low levels FBI → Alter cytokines and antibodies, → opportunistic pathogens, ↓ vaccine protection → FBI + OTA and FBI + DON more toxicity

### DEOXYNIVALENOL (DON)

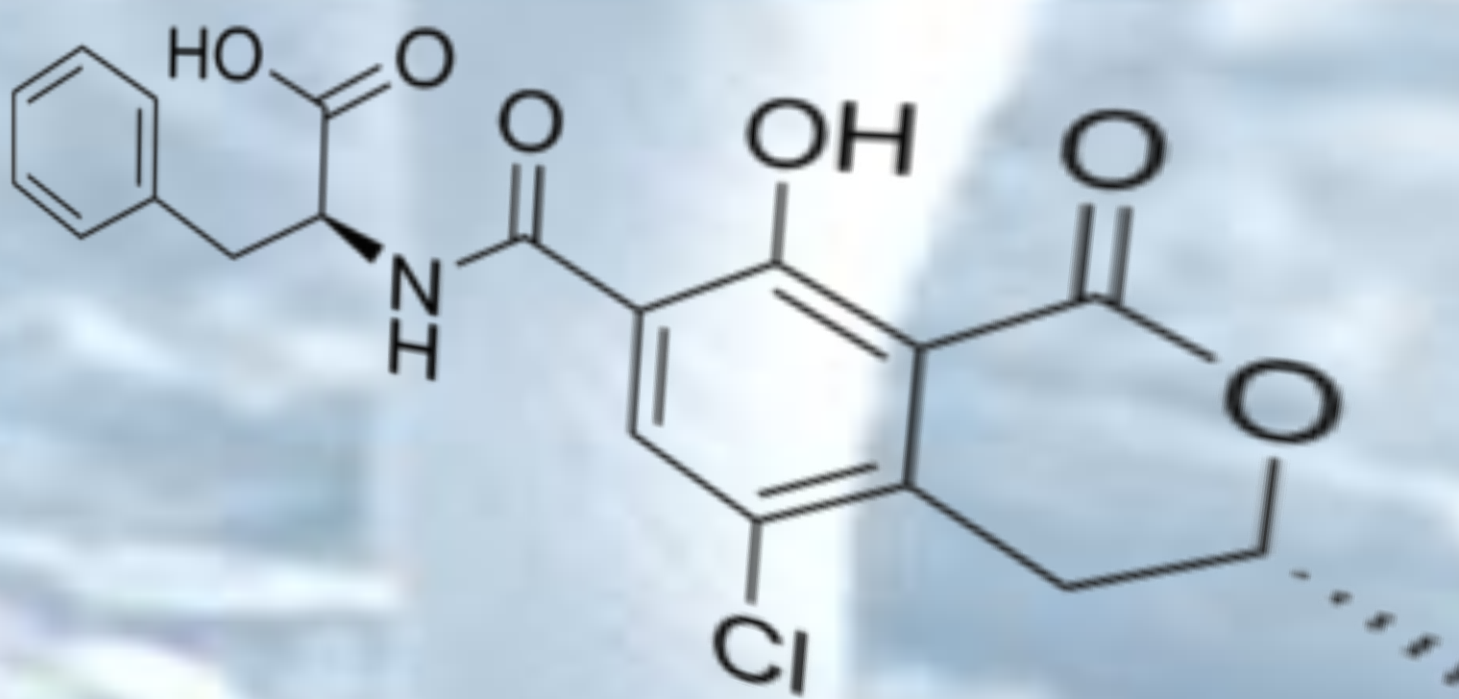
Produced by *Fusarium graminearum* and *F. Culmorum*.



- ✓ High-medium doses: effects in digestive system → vomiting and feed-refusal
- ✓ Low levels DON → Objective → cells actively dividing → Alters principal functions of PMN's, leukocytes, antibodies response, lymphocytes, cytokines and other different cells. → ↓ the protective of intestinal barrier function, immunosuppressive or immunostimulatory, alters vaccine efficiency.

### OCHRATOXIN (OTA)

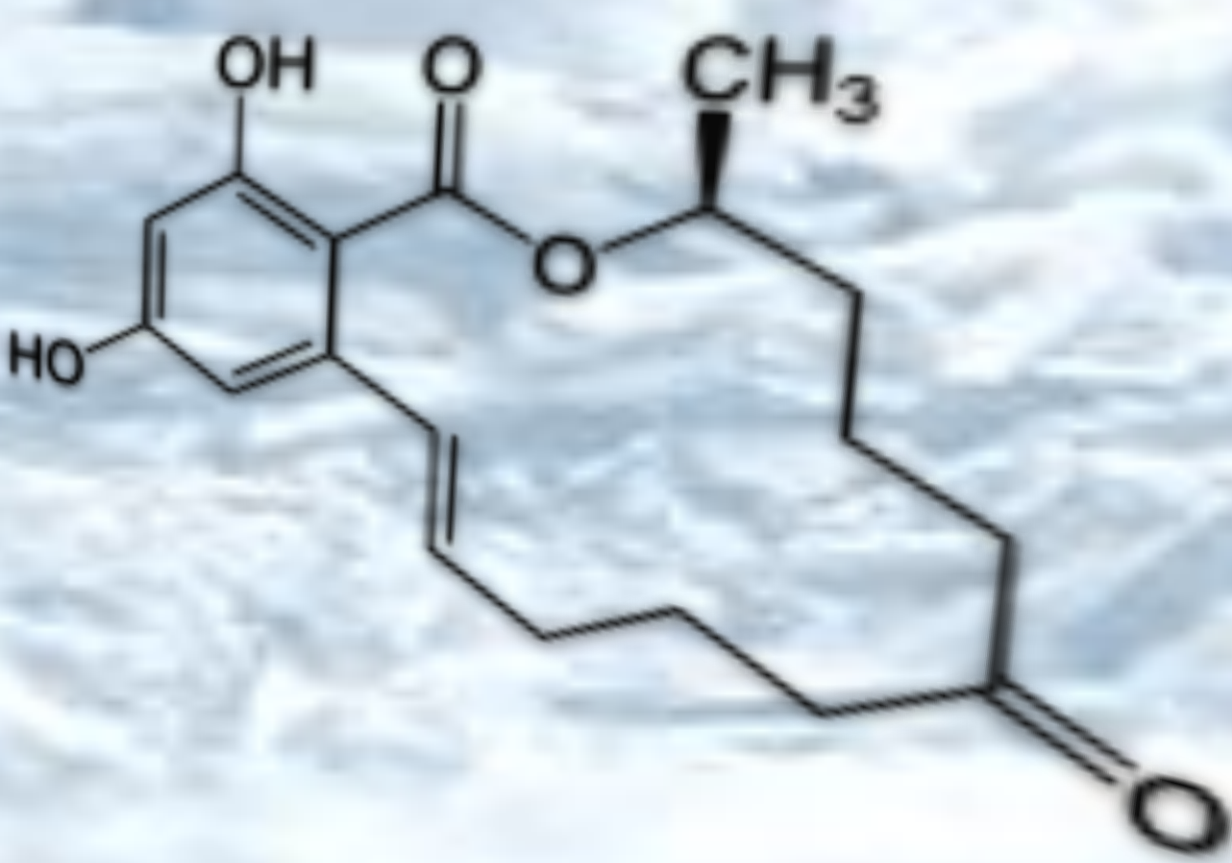
Produced by genus of *Penicillium* and *Aspergillus*



- ✓ High-medium doses: nephrotoxic effects
- ✓ Low levels OTA → Alters antibodies response → immunosuppressive, ↓ vaccine response

### ZEARALENONE (ZEN)

Produced by *Fusarium graminearum* and *F. Culmorum*



- ✓ High-medium doses: reproductive effects → hyperoestrogenic syndromes
- ✓ Low levels ZEN → Alters PMN's, mononuclear cells, TNF and cytokines → immunosuppressive or immunostimulatory, inflammatory response → ZEN + other mycotoxins *Fusarium* → ↓ body weight

## CONCLUSIONS

- Subclinical doses of most Mycotoxins affect the immune response (including response to a vaccine).
- Vaccination failure or altered immune response predispose to an increase of secondary infections.
- Apparition of diseases implies the use of antibiotics, and thus, an increase of waste in meat.
- All these facts together, produce significant economic losses in the farm.

