MUSHROOM VERSUS MYCOTOXINS IN FOOD AND FEED: MUSHROOM METABOLITES IN CONTROL AND DETOXIFICATION
Mycotoxins – toxic secondary metabolites produced by some fungi toxic for humans and animals. Only some fungal species produce mycotoxins, and they are referred to as toxigenic.

Aspergillus flavus

Aspergillus carbonarius
- Aflatoxin B1
- Ochratoxin A
- Patulin
- Fumonisin
- Ergot alkaloids
- Citrinin
- Zearalenone

EC 1881/2006
Mycotoxins

- immunosuppressive
- genotoxic
- carcinogenic

Mycotoxicosis in animal production

- Supression of the immune system ➔ major exposure to illness
- Interference with reproduction
- Impairment of growth

= Economic loss
Aflatoxin

Susceptible Foods

Feed Source

Human Consumption

Food Poisoning
WHO: it is almost impossible to produce food and feed completely free of mycotoxins.

Contamination with mycotoxins is a worldwide problem.
Different strategies to prevent mycotoxin contamination has been applied, but, till now, no one was resoluble.

Prevention and control strategies chemical compounds.

- antifungals
- antioxidants
- fungistatics

EC - since 2014. banned 50% of chemicals used in agriculture
There is a need to develop more environmentally friendly tools and methods

Mushroom glucans:
- non-toxic
- edible
- antioxidant activity
- enhance the immune system
- considered healing properties
- mitigate the negative effect of mycotoxins on animal health
Prevention

the long lasting control of the biosynthesis of different mycotoxins at the same time.

Production of Ochratoxin A from *Aspergillus carbonarius* fungus treated and untreated with polysaccharides A, B and C, after 21 days of incubation

Production of Aflatoxin A1 from *Aspergillus flavus* fungus treated and untreated with polysaccharides A, B, and C after 21 days of incubation
Detoxification

AFB1 degrading potential of *T. versicolor* laccases on contaminated maize seeds

*A. flavus* inoculation on maize seeds (1 kg)
Abot 1 ppm of AFB1 is produced after 10 days of incubation

Most cultural filtrates (xylidine stimulated) degrade more than 90% of AFB1 on maize seeds after 72 h of incubation
Conclusion

Edible non-toxic mushrooms metabolites present potentially powerful tools for controlling mycotoxin contamination and detoxification of food and feed.

The commercial application is under the study.
Thank you for your attention!