

Interest of the new functionality to regulate the mycotoxins contamination in feed



1/ FEFANA Introduction

2/ FEFANA actions on Feed safety

3 / Mycotoxins: general problem

4/ How to limit the mycotoxins risk

- **Prevention concept**
- **Using mycotoxins inactivator**

5/ Regulatory status for mycotoxins control

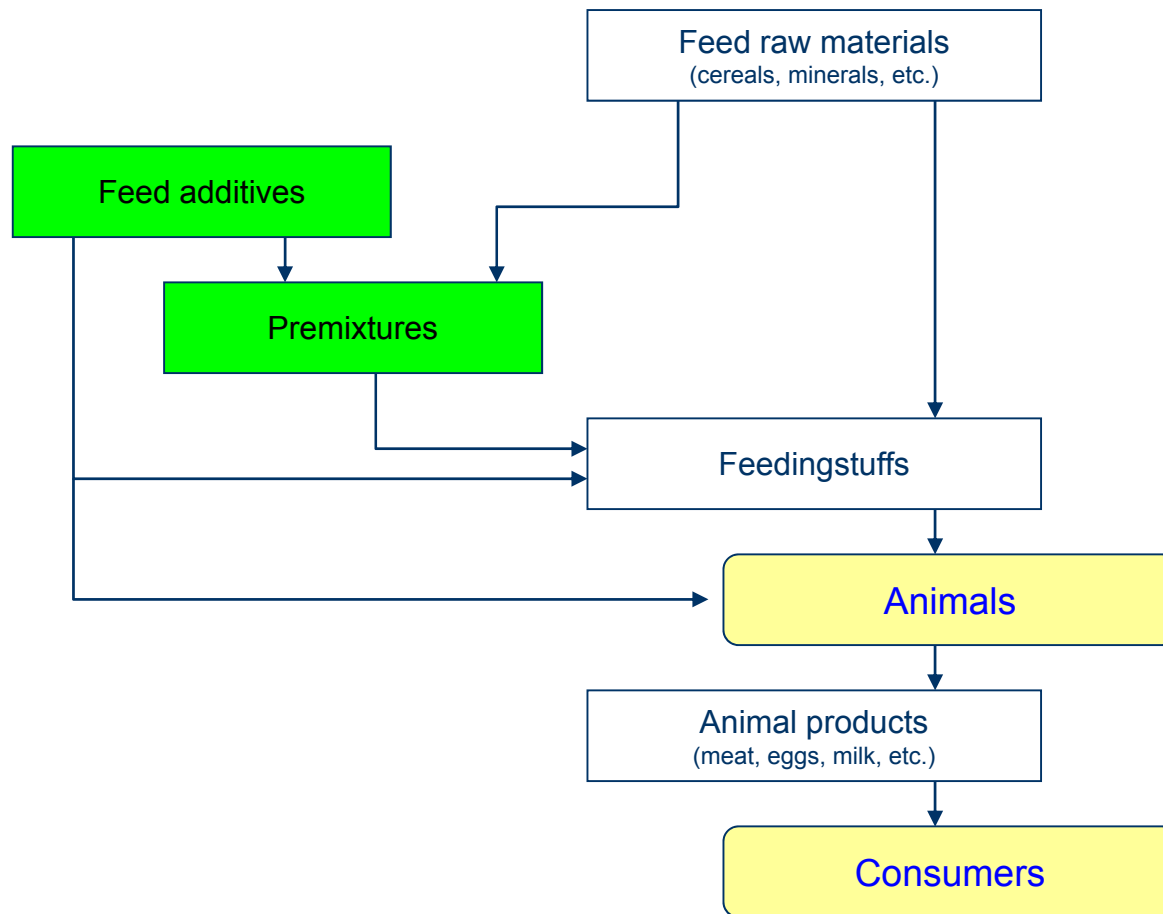
- **General rules**
- **New regulation**

6/ Conclusion

Introduction to FEFANA

- The EU Feed Additives and Premixtures Association
- Set up in 1963
- Covers all categories of feed additives (e.g. vitamins, amino acids, trace, emulsifiers, acidity, silage, acids, binders, enzymes, microorganisms, etc.)
- Premixtures
- Covers all EU operators (producers and traders)
- Covers 27 European Union countries

Introduction to FEFANA



FEFANA actions on Feed Safety

- High commitment of EU feed additive industry
- Comprehensive pre-market approval system
- Committed to re-authorisation of all feed additives under Regulation 1831/2003
- Support consortia
- Safest part of the chain
 - Transparency (identification, specifications, etc.)
 - Risk assessment EFSA + HACCP

FEFANA actions on Feed Safety

- Comprehensive Regulatory framework
- Feed additive / Feed Hygiene / control Reg.
- Active engagement on Feed Hygiene Regulation
- FAMI-QS establishes itself as THE reference for hygiene of Feed additives and premixture
- Over 500 sites in system (incl. ca. 50% in prominent third countries)
- Global exchanges have big impact on feed safety and FAMI-QS strongly contribute to harmonising practices

FEFANA actions on Feed Safety

- Only safe Feed Additives pass through the EU risk assessment
- Feed Hygiene aims at only compliant operators but need for sustained control
- Feed additives can contribute to enhancing the safety of the chain by their functions (on feed)
- Latest prominent example on cumbersome “mycotoxin risk”

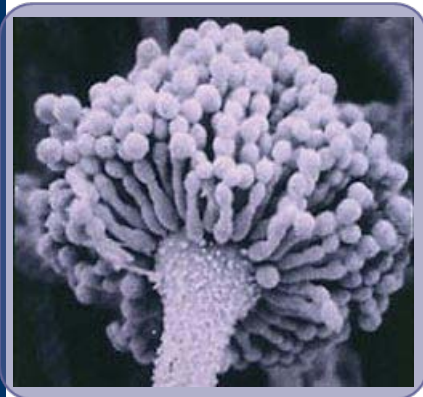
1/ MYCOTOXINS: GENERAL PROBLEM

Properties of mycotoxins

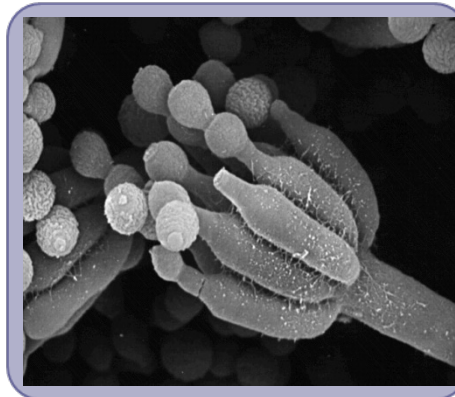
Mycotoxins = secondary metabolites secreted by moulds growing on plants and plant products

1 mould ➔ several mycotoxins

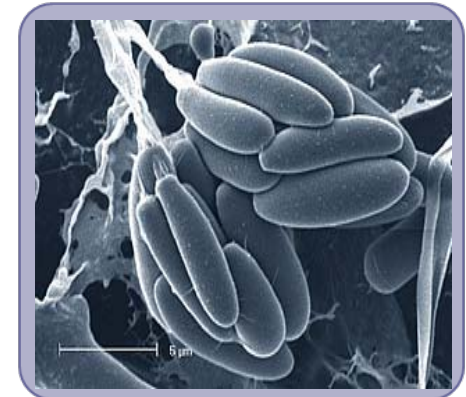
1 mycotoxin ➔ several mould species



Aspergillus spp.

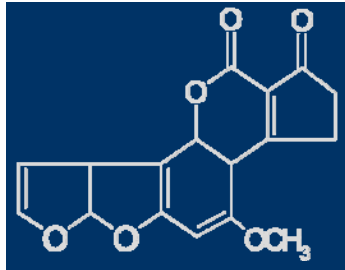


Penicillium spp.

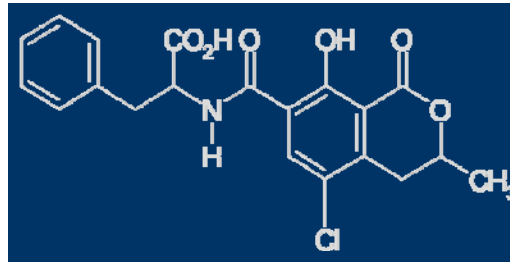


Fusarium spp.

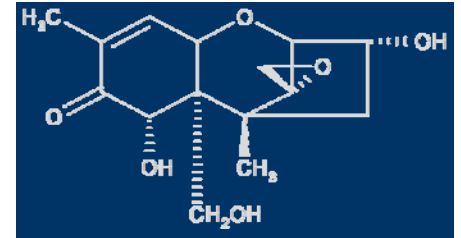
Highly diversified molecules



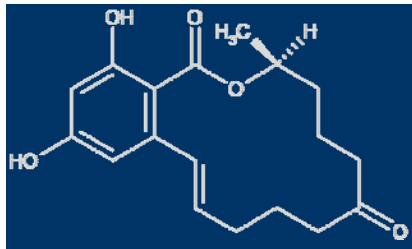
Aflatoxin B1 (AFB1)
Aflatoxins



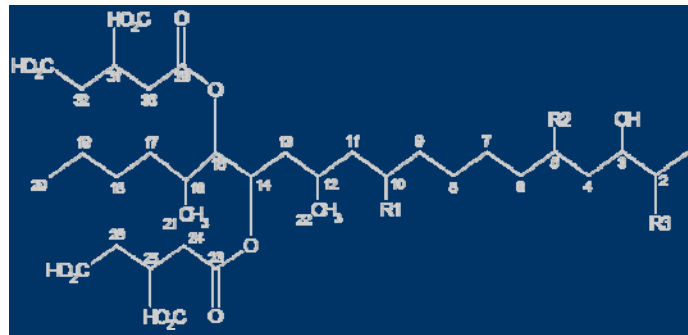
Ochratoxin A (OA)
Ochratoxins



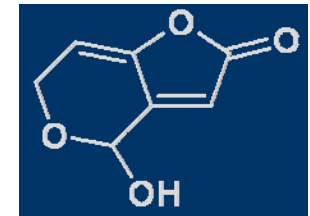
Deoxynivalenol (DON)
Trichothecenes



Zearalenone (ZEN)



Fumonisin B1 (FB1)



Patulin (PAT)

Diversified chemical structure \Rightarrow various toxic effects

Global consequences of mycotoxins on animal production

**Significant negative effects on production
(growth, milk production, ..)**

**Animal health troubles → veterinary
expenses**

**1- Loss
of money**

**Possible transfer of toxins (or toxic
metabolites) to animal products
(e.g. milk, eggs, meat)**

**2- Affecting food
safety**

**The regulation of undesirable substances
covers this aspect**

HOW TO LIMIT THE MYCOTOXINS RISK ?

- **Prevention concept**
« from the field to the plate »

Methods to prevent mycotoxin contamination of feeds and foods

1- In the field

Agricultural practices (crop rotation, resistant varieties, harvesting conditions, antifungal, ...)

2- During storage

Elimination of contaminated crops
Moisture and insect control

3- Processing and manufacturing

GMPs for food and feed
Quality control for feed and food manufacturers

4- Physical and chemical treatments of contaminated feeds or foods

Physical (washing, flotation, heating, irradiation, ...)
Chemical (solvent extract., acids or bases, oxidizing or reducing agents, ...)

⇒ **But mycotoxins cannot be entirely eliminated**

Prevention and Regulation

- Regulatory standards (maximum levels) provide :
 - a benchmark against the effectiveness of the successful implementation of prevention programs
 - a tool for control authorities to control the correct application of prevention measures by each actor in the chain
- Fixing maximum limits :
 - not contrary to prevention
 - should be fixed at a reasonably achievable level but stimulating a preventive approach
 - stimulates preventive actions at all stages to avoid contamination of the feed/food chain

HOW TO LIMIT THE MYCOTOXINS RISK ?

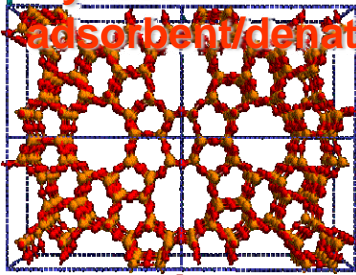
- **Using Mycotoxin inactivators**

Substances for the control of mycotoxin

- Agents able to chemically interact *in vivo* with feed-derived mycotoxins and restrict their absorption in the digestive tract of animals
- Products usually called adsorbents or denaturants
 - Adsorbent (organic, inorganic)
 - Denaturant (enzymes, microbes)

How do mycotoxin adsorbents/denaturants work?

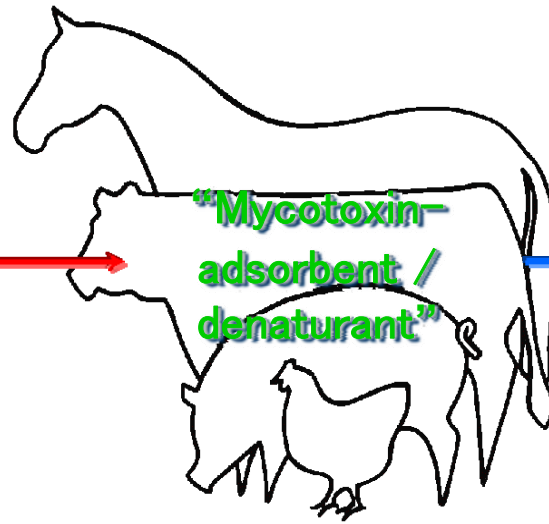
Mycotoxins adsorbent/denaturant



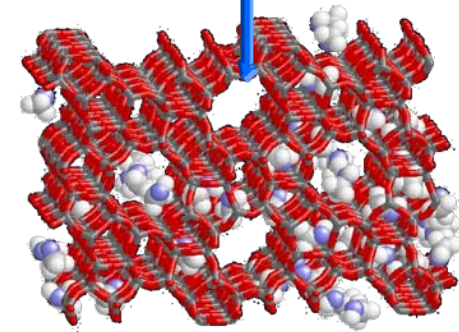
Ingestion



Contaminated feeds



Excretion



Feces

- Mycotoxins are fixed on or deactivated by the mycotoxin adsorbent/denaturant during ingestion
- ➔ Harmful effects of mycotoxins are strongly decreased
- ➔ Less mycotoxins are transferred to the animal products (eggs, milk, meat)

3/ REGULATORY STATUS FOR MYCOTOXINS CONTROL

- **General rules**
- **New regulation**

European feed law regarding mycotoxins (Overview)

- **Regulation (EC) No 178/2002** of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements for food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety
- **Directive 2002/32/EC** of the European Parliament and of the Council of 7 May 2002 on undesirable substances in animal feed
- **Regulation (EC) No 183/2005** of the European Parliament and of the Council of 12 January 2005 laying down requirements for feed hygiene
- **Regulation (EC) No 1831/2003** of the European Parliament and of the Council of 22 September 2003 on additives in animal nutrition
- **Commission Regulation (EC) No 429/2008** of 25 April 2008 on detailed rules for the implementation of Regulation (EC) No 1831/2003 of the European Parliament and of the Council as regards the preparation and the presentation of applications and the assessment and the authorisation of feed additives

Directive No 2002/32: Undesirable substances

- **Regulated mycotoxins**

Maximum levels are set in Annex I of the Directive 2002/32/EC for two mycotoxins:

- **aflatoxin B1**
 - Maximum content in mg/kg relative to a feed with 12% moisture
 - Varied from 0.005 to 0.05
 - Feed material, complete feed, complementary feed...
- **Rye ergot***

All feedingstuffs containing unground cereals 1000 mg/kg (relative to a feedingstuff with a moisture content of 12%)

*) Based on the opinion of the EFSA, adopted on 19 April 2005, relating to ergot as an undesirable substance in animal feed, the European Commission presented a draft for a Commission Recommendation on the presence of ergot in products intended for animal feeding.

- **No other mycotoxins are regulated in feed**

Commission Recommendation 2006/576 for animal feed

- Deoxynivalenol (DON)
- Zearalenone (ZEA)
- Ochratoxin A (OTA)
- Fumonisin B1+B2 (FB1, FB2)
- T-2 Toxin (T2)
- HT-2 Toxin (HT2)

Levels vary from 0.05 to 60 mg/kg feed
(12% moisture)

Regulation (EC) No 1831/2003 (feed hygiene)

Requirements for feed hygiene

1. Feed business operators (with the exception of primary producers) shall put in place, implement and maintain procedures based on HACCP principles. Specific requirements are fixed in Annex II of the regulation.
2. Feed business operators at the level of primary production of feed shall comply with the provisions in Annex I of the regulation. Annex I encloses recommendations for guides to good practice including “***the control of contamination such as mycotoxins ...***”.

REGULATORY STATUS FOR MYCOTOXINS CONTROL

- **New regulation**

New Regulation

Regulation 386/2009 amending Regulation 1831/2003 as regards the establishment of a new functional group of feed additives

Feed additive categories :

- 1) Technological additives
- 2) Sensory additives
- 3) Nutritional additives
- 4) Zootechnical additives and
- 5) Coccidiostats and histomonostats

Regulation 386/2009

Feed additive category :

1) Technological additives

Functional groups:

a) Preservatives

b) antioxidants

...

m) substances for reduction of the contamination of feed by mycotoxins: substances that can

- suppress or reduce the absorption,
- promote the excretion of mycotoxins
- or modify their mode of action

Defined end points

- Efficacy should be demonstrated with *in vitro* assays using levels of mycotoxins below the maximum limits defined by the US, Council Directive 2002/32 (AFB1) and the Commission Recommendation 2006/576 (DON, ZEA, OTA, FB1+FB2, T2, HT2).
- No hiding effect of mycotoxins in feed. Present mycotoxins remain quantitatively detectable (→ NO cleaning of adulterated feed and feed materials)
- Nutritional values are not compromised (energy level, protein levels, vitamins, etc.)

Applicant requirement

- **Regulation (EC) No 1831/2003** of the European Parliament and of the Council of 22 September 2003 on additives in animal nutrition
- **Commission Regulation (EC) No 429/2008** of 25 April 2008 on detailed rules for the implementation of Regulation (EC) No 1831/2003 of the European Parliament and of the Council as regards the preparation and the presentation of applications and the assessment and the authorisation of feed additives

CONCLUSION

Mycotoxin inactivator

- **Totally fits in the concept of prevention**
- **A tool to further improve:**
 - **quality assurance**
 - **safety of feed and food**
- **Not capable of cleaning alleviated feed materials**
- **Pre-market approval.**

All products must be subject to an application dossier (1831/2003) before coming on EU market

Thank you for your attention

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The many ways of saying
XIEXIE "Thank You" SPASIBO
GRACIAS Dank u Grazie Mahalo
Merci Danke WA-DΘ
Arigato Shanyawaad Asante