

MYCOTOXIN IN DAIRY CATTLE NUTRITION

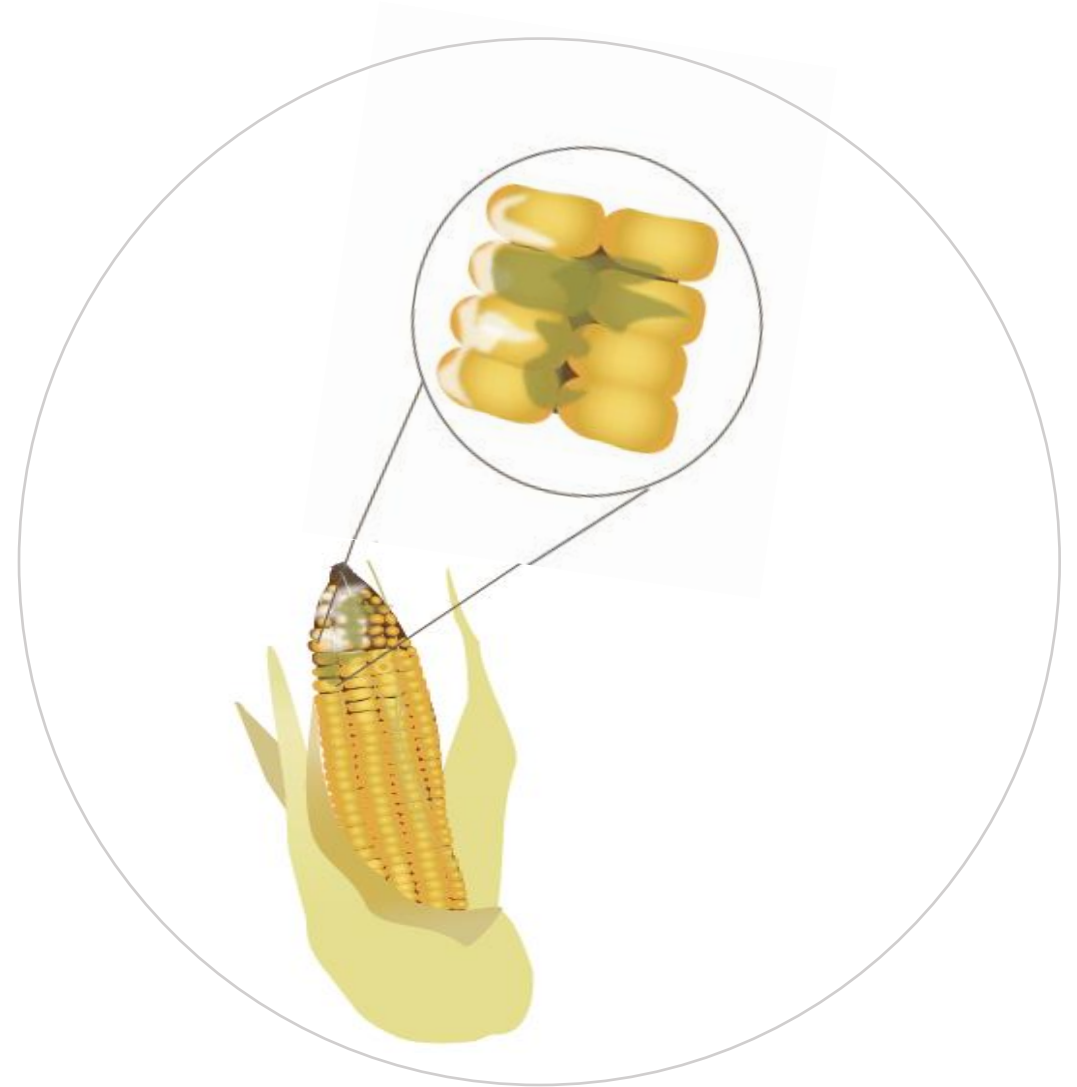
(Level 1)

Topic	Training & information Content
3.1	Estimating feeding value of fodder & feed on dairy farms
3.2	Sampling feeds & forages/analysis interpretation
3.3	Estimating Dry Matter intake for various breeds/age categories of dairy cattle in the tropics
3.4	Reviewing feed intake, rumen fill, Body Condition Scoring (BCS)
3.5	Life weight estimation of cows
3.6	Rumen fermentation
3.7	Mineral & vitamin requirement, guidelines
3.8	Manure scoring and evaluation
3.9	Guidelines for ration calculations for various breeds, heifers, lactation stage (Rumen8)
3.10	Use of Rumen8 software for ration calculation
3.11	Optimization of ration with Rumen8
3.12	Feeding management guidelines
3.13	Feeding management of dry cows/close-up
3.14	Feeding systems
3.15	Metabolic disorders
3.16	Scoring locomotion and hoof condition
3.17	Mycotoxin in dairy cattle nutrition
3.18	Heat stress in dairy cattle nutrition
3.19	Monitoring feeding management, using KPIs (based on Rumen8)



1. You will learn about (learning objectives):

- Mycotoxins and their causes/sources.
- Mycotoxins in animal feedstuffs.
- How to identify and prevent mycotoxins in at farm level.



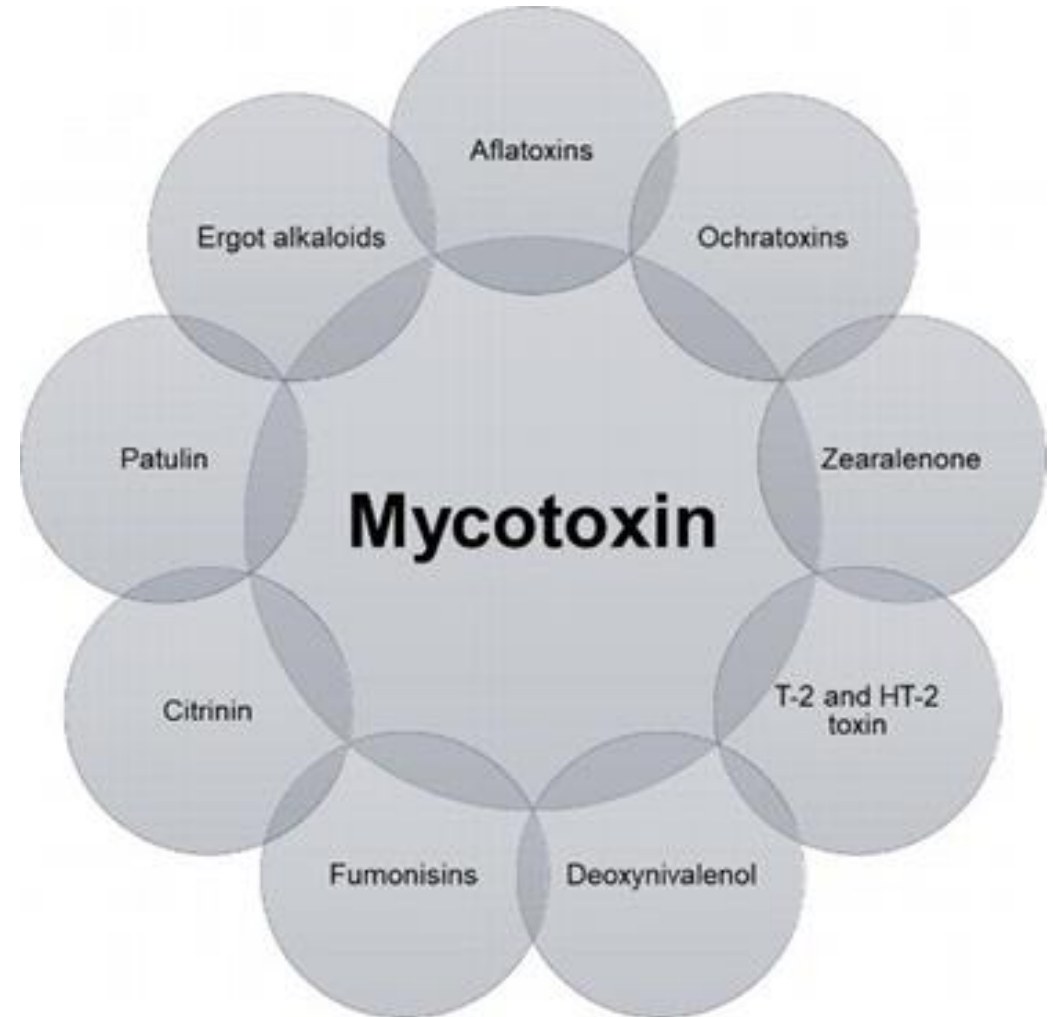
2. Introduction

- Mycotoxins are produced by fungi (molds).
- Feeds with mycotoxins reduce feed quality.
- Mycotoxins taken by cows causes diseases because of mycotoxin toxicities.



2.1 Introduction cont'd: **Mycotoxins**

- Mycotoxins are a number of many toxins found in animal feed.
- Different fungi produce different toxin substances that are known by different names.
- For example: Aflatoxin is produced by *Aspergillus* fungi.



3. Conditions for fungal growth

- Fungi like damp/moist conditions in nature to produce molds (fungal growth).
- Mold grows well in;
 - i. High humidity (wet condition).
 - ii. High temperature.

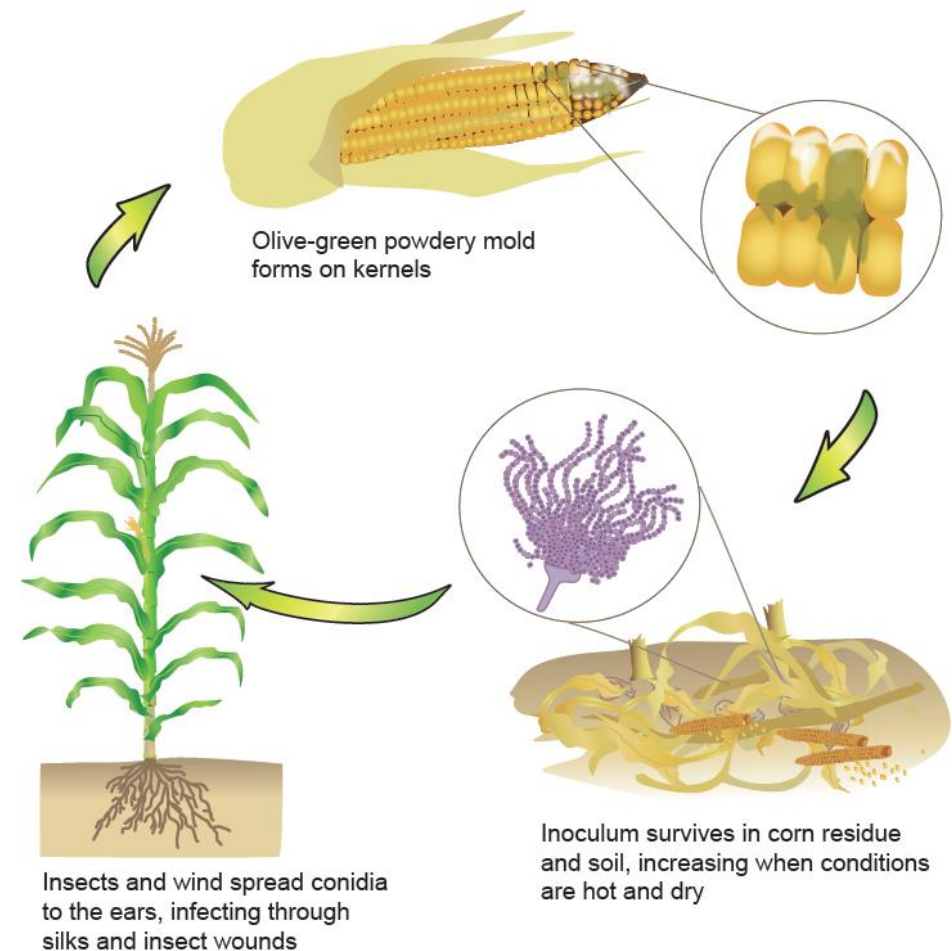


High humidity (wet condition)



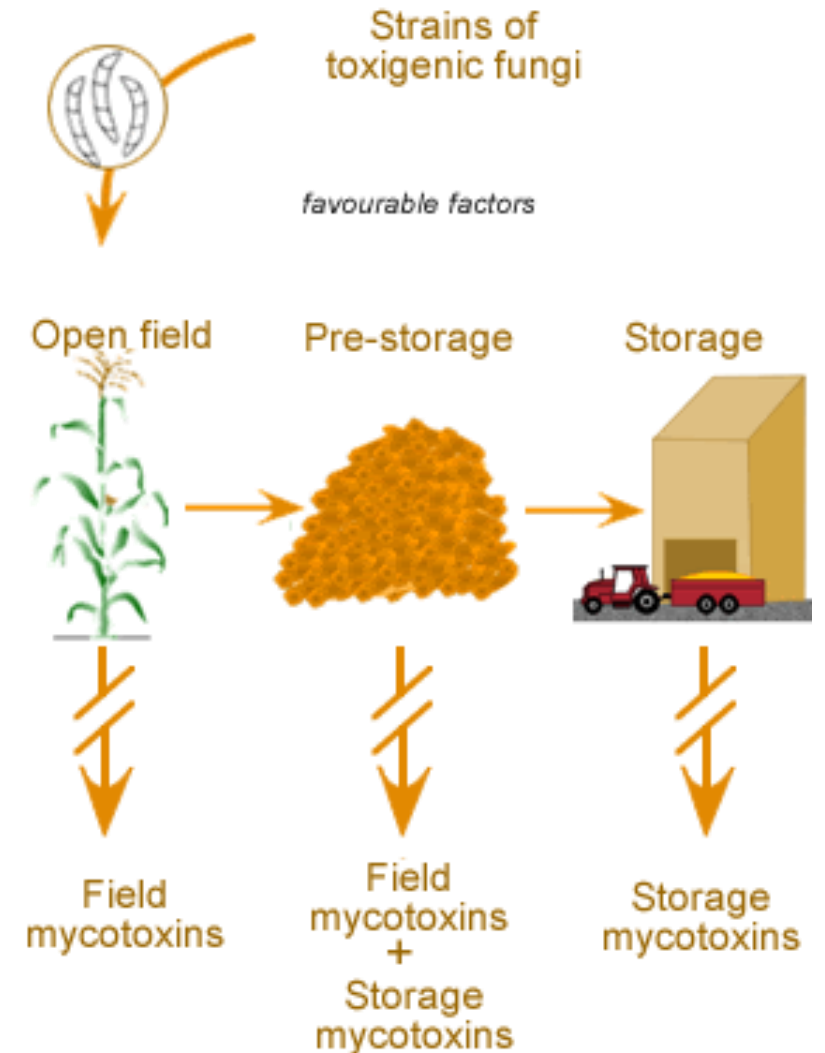
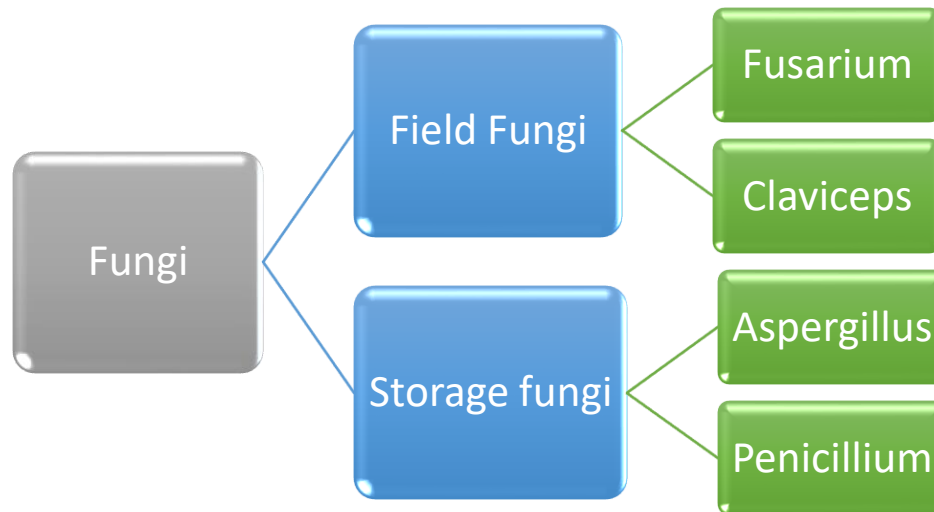
4. Insects and fungal growth

- Crops that are damaged provide place for fungi to enter and cause fungal infections.
- Damaged grains by insects allow seed to absorb more water from environment.
- This encourages fungal growth leading to mold growth.



5. Types of Fungi

- Fungi-producing mycotoxins get in contact with plants at different stages in the fields.
- These fungi are clustered into:
 1. Field fungi
 2. Storage fungi



5.1 Field Fungi

- These fungi invade crops before and after harvest.
- Many plant diseases are produced by fungi.
- Examples of diseases are: Ear rot, stalk rot, anthracnose, smut disease.



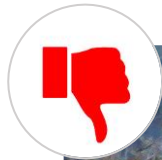
5.2 Storage Fungi

- These fungi invade forages and grains during storage.
- Mostly affects forages and silages.
- Examples of storage fungi include;
 - Aspergillus
 - Penicillium



6. Signs of fungal growth in forages

- Discoloration by molds on forages i.e. white, reddish to dark brown color.
- Dump forages at the points of water entry.
- Musty to no smell in some cases, especially silage.



7. How to avoid fungal growth in forages

- Hay should be properly dried.
- Bale forages at low moisture of more than 80% DM.
- Store bales properly;
 - Above the ground and well spaced.
 - Area fully protected from rain damages.



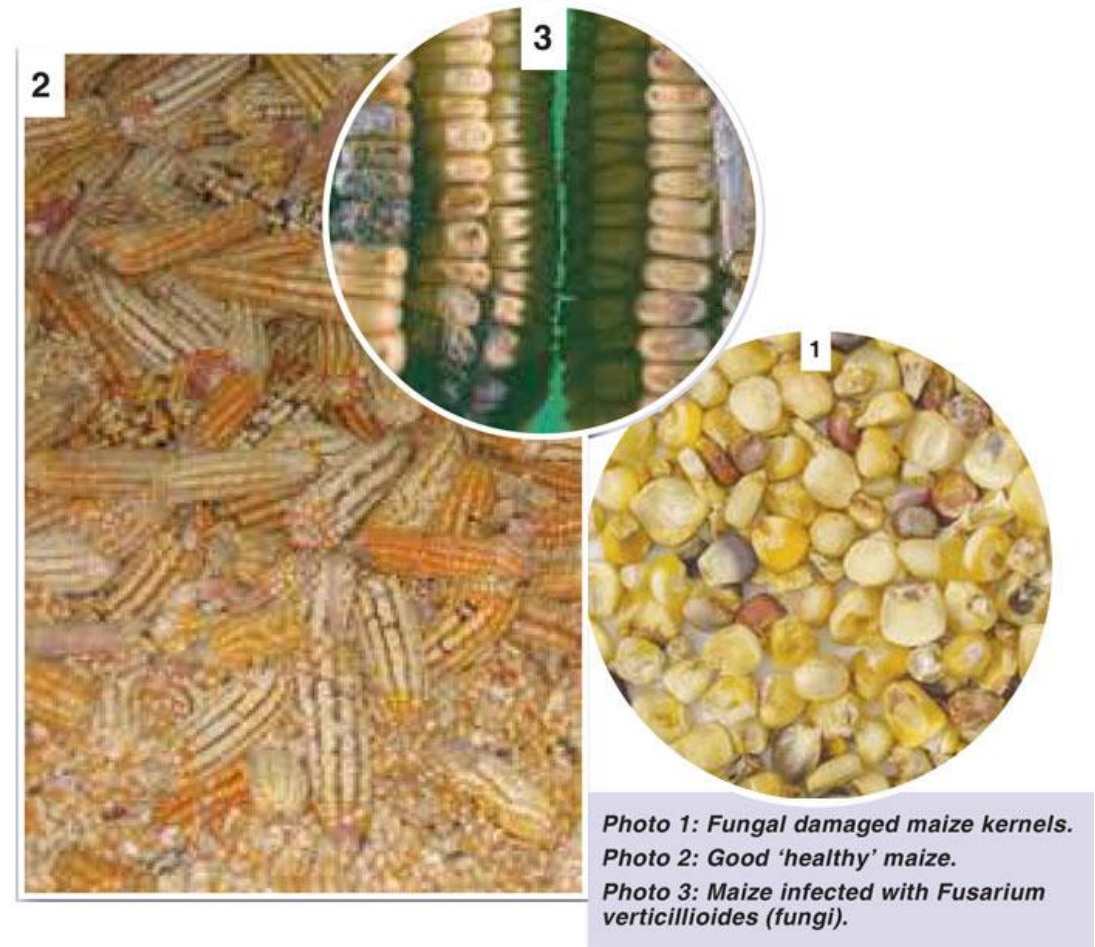
8. Signs of fungal growth in feeds (grains)

- Light weight of grains.
- Soft seedcoat.
- Easily breakable grains that seem moist when pressed between fingers.
- Discolored grain by mold (white, pink or grey-green color).
- Musty smell in some cases.



9. Mycotoxins in grains

- Mycotoxins get to grains while in the field and storage.
- Mycotoxin affects;
 - Disease-infested grains especially by fungi.
 - Damaged grains.
 - Grains that are not sufficiently dried before storage.
 - Grains with high moisture content above 12%-15%.



*Photo 1: Fungal damaged maize kernels.
Photo 2: Good 'healthy' maize.
Photo 3: Maize infected with Fusarium verticillioides (fungi).*

10. Managing fungi in farms

Crop management practices

- Crop rotation.
- Grow hybrid crop varieties. Example: Fusarium resistant crops (hybrid) to break the cycle of diseases (Fusarium ear rot).
- Spray fungicides to control fungi that cause diseases to crops.
- Harvest crops and at right time and moisture to reduces mold growth & mycotoxin contamination.

