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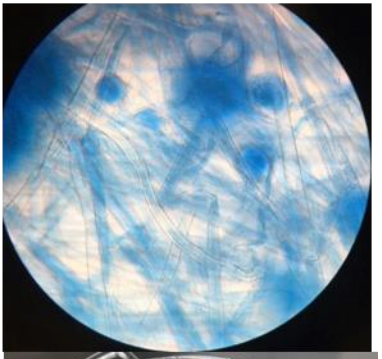

One Health Approach in Feedlots and Dairies

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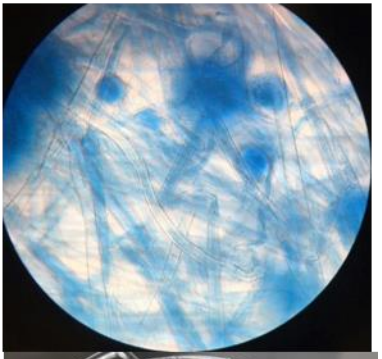
Outline



- Background
- Study objectives
- Materials and methods
- Results
- Main takeaways

The authors declare that they have no financial or non-financial conflicts of interest related to the work presented in this study.

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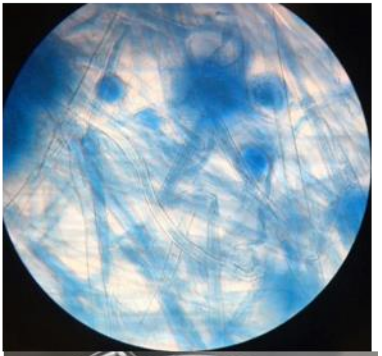
1 - Background



- Growing demand for animal products increases pressure on agriculture
- Workers exposed to bacteria, fungi, and toxins in livestock farms
- Climate change increases fungal adaptation and mycotoxin risks
- One Health links animal, human, and environmental health

(Ortiz et al., 2021; Tilman et al., 2011; Zhang et al., 2024; European Agency for Safety and Health at Work (EU-OSHA) 2017; Gomes et al. 2025; Viegas et al., 2021)

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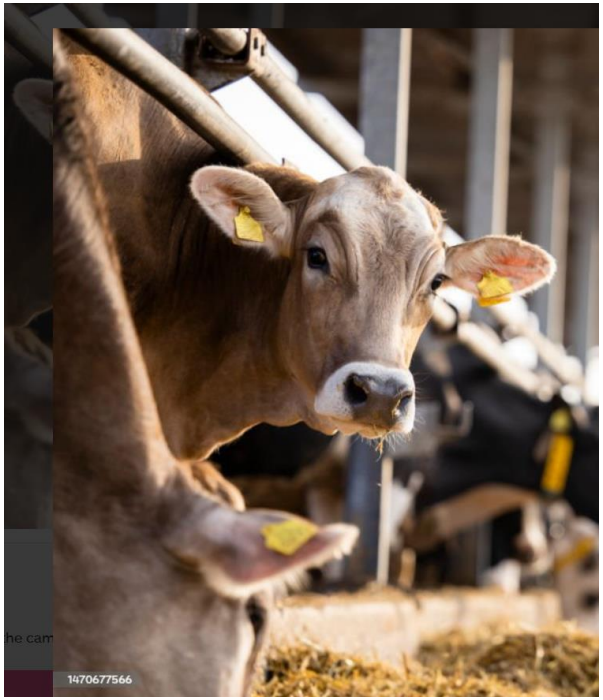
2 - Study objectives

- Assess microbial contamination in feedlots and dairies
- Evaluate azole-resistant fungi and mycotoxins
- Apply a One Health framework



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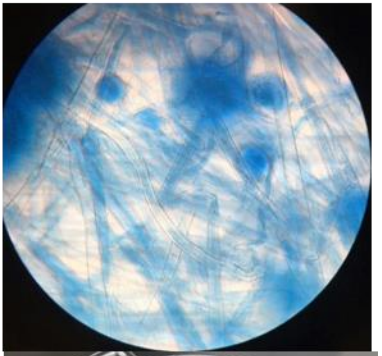
3 - Materials and methods



- 3 feedlots and 2 dairies in Northern Portugal (Viana do Castelo).

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Targeted Farms	Sampling sites	Sampling methods	Assays

Feedlot farms
(n=3)

Dairies
(n=2)

Farm building

Offices and Changing rooms

Feeders

Drinkers

Milking parlors

EDCs
(n=9)

EDCs on T-shirt
(n=2)

Surface swabs
(n=17)

Feed
(n=16)

Bedding
(n=6)

Culture-based methods (fungi and bactéria:

- Microbial quantification (fungi and bactéria)
- Fungal identification

Toxigenic fungi species detection through qPCR

Azole resistance screening

Mycotoxins detection

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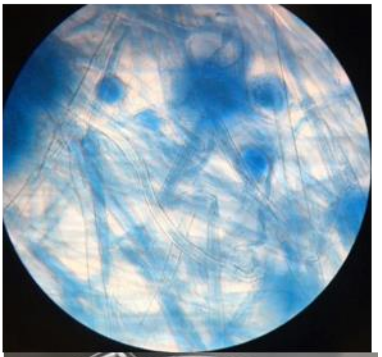
4 - Results - Bacterial contamination



- Dairy farms showed higher bacterial contamination
- Bedding and surfaces were major reservoirs
- Feed contamination indicated sanitation concerns
- Worker clothing samples revealed high exposure

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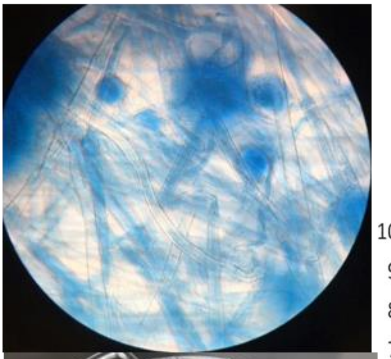
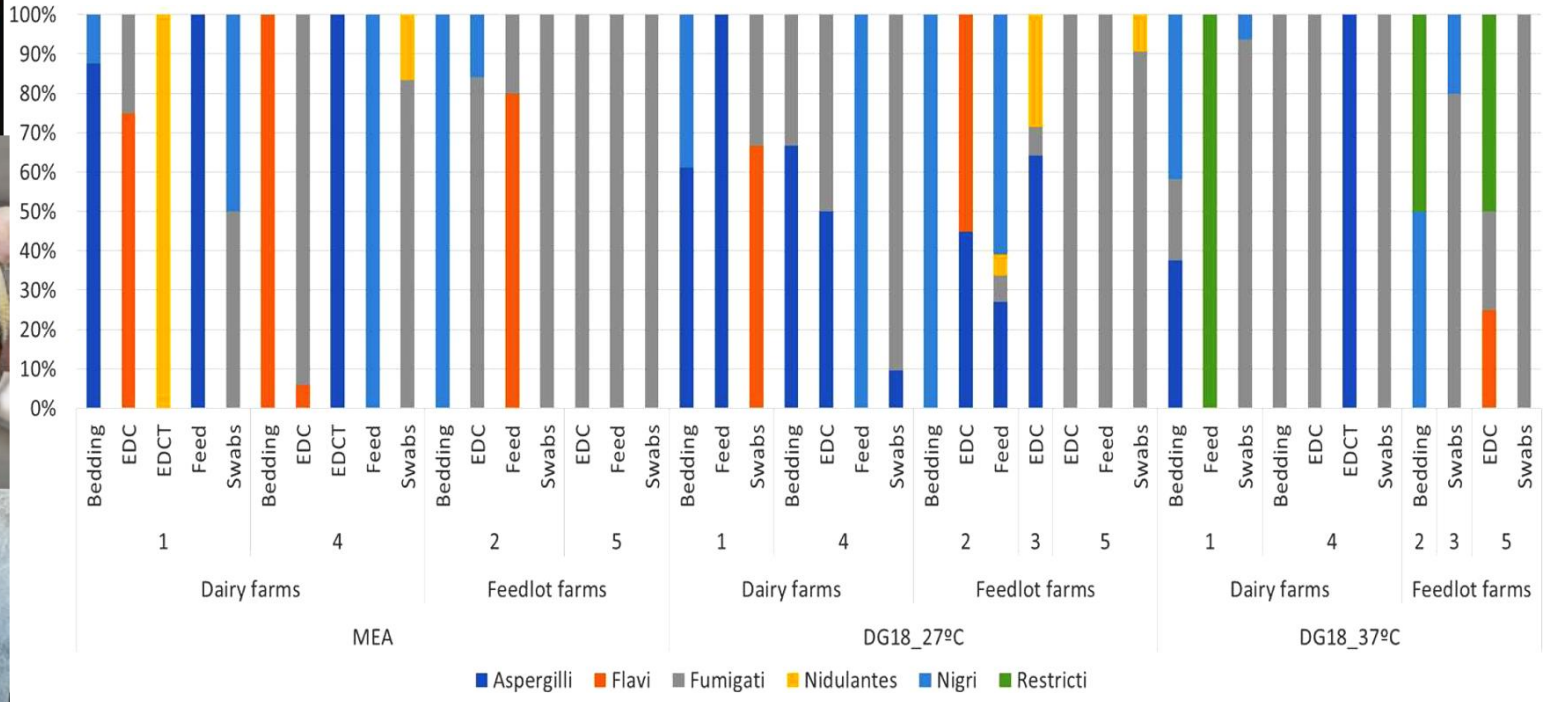
4 - Results - Fungal contamination



- *Aspergillus, Penicillium*, and *Fusarium* genera widely detected
- Feed and swabs had highest fungal contamination
- Thermotolerant fungi detected at 37°C



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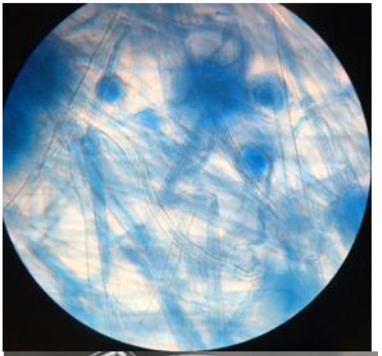
4 - Results - Azole resistance



- Resistant fungal growth detected in environmental samples.
- Evidence of environmental antifungal pressure.
- Resistant strains linked to agricultural fungicide use.
- Continuous monitoring recommended.

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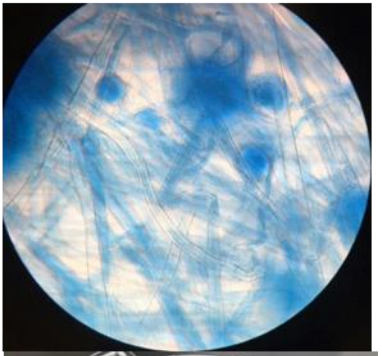
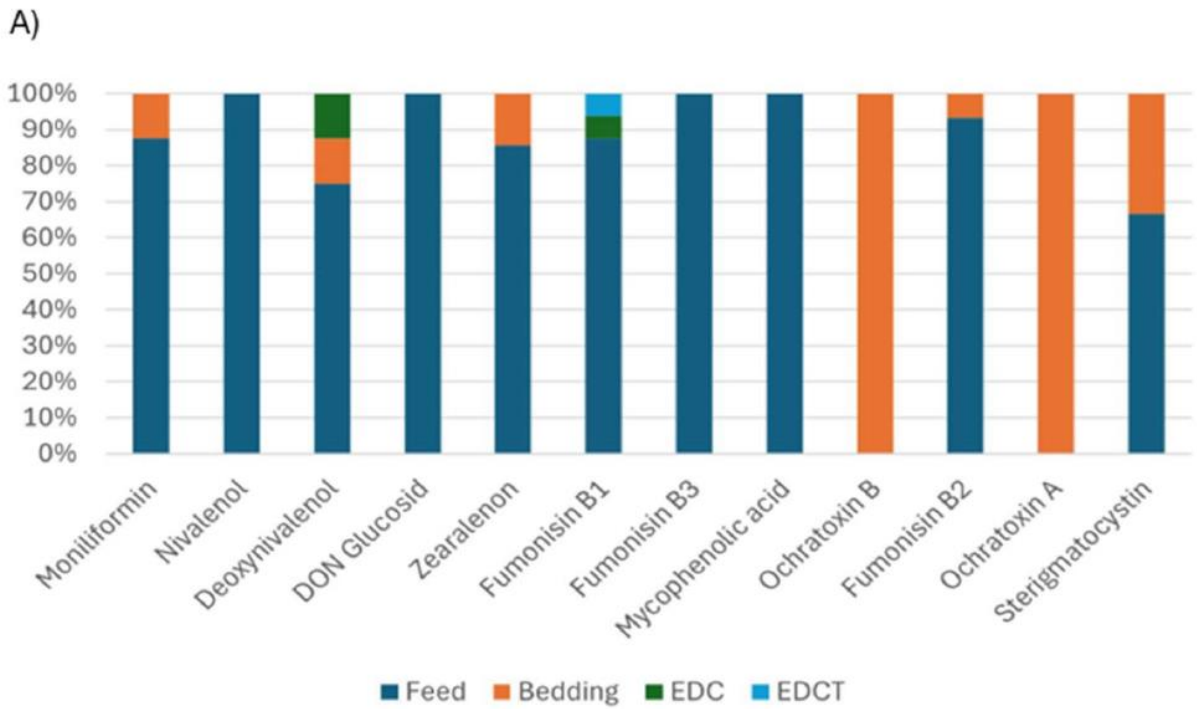
4 - Results - Mycotoxins



- All feed samples contaminated with mycotoxins
- FB1, FB2, ZEA, DON, and OTA detected
- Feed identified as the main exposure source
- Co-contamination common in most samples



6 - Main takeaways

Highlights

- Broad sampling identified key matrices for microbial and mycotoxin risks.
- Bedding had highest bacterial contamination; swabs and feed highest fungi.
- Feed is the main source of mycotoxin exposure for animals and workers.
- Combining culturomics and qPCR improved risk assessment accuracy.
- One Health approach is essential for managing resistance and toxin risks.

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The need of a one health approach to tackle microbiological contamination in animal and dairy production - the case of Portuguese feedlots farms and dairies

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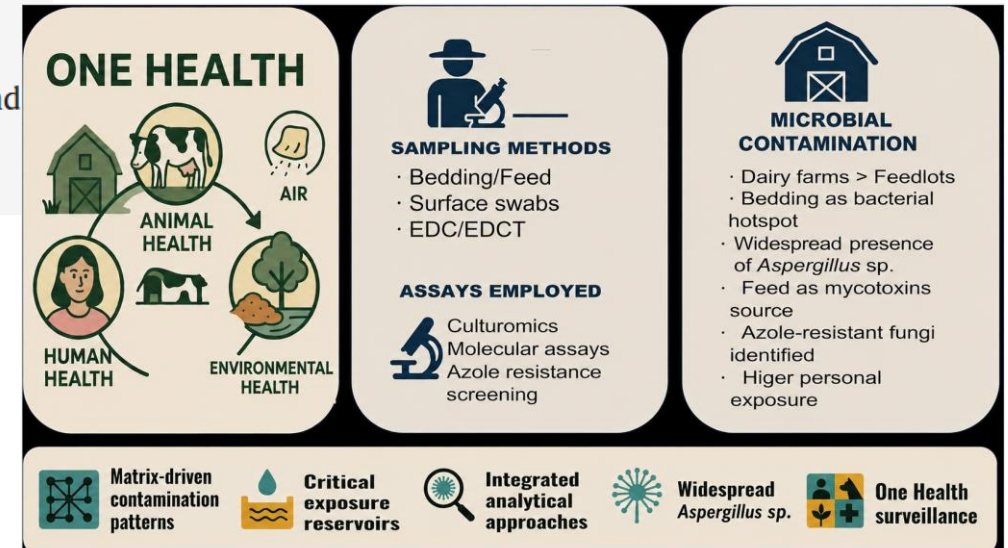

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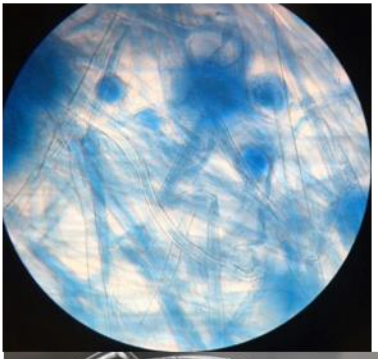

One Health Approach in Feedlots and Dairies

Thank you!!