

From exposure assessment to policy needs: Unrecognized *Aspergillus* spp. hazards in poultry farming

Bianca Gomes^{1,2,*}, Celeste Simões³, Carla Viegas^{1,4}

¹ Center for Ecology, Evolution and Environmental Change, Faculdade de Ciências, Universidade de Lisboa, 1749-016 Lisbon, Portugal

² H&TRC- Health & Technology Research Center, ESTeSL- Escola Superior de Tecnologia da Saúde, Instituto Politécnico de Lisboa.

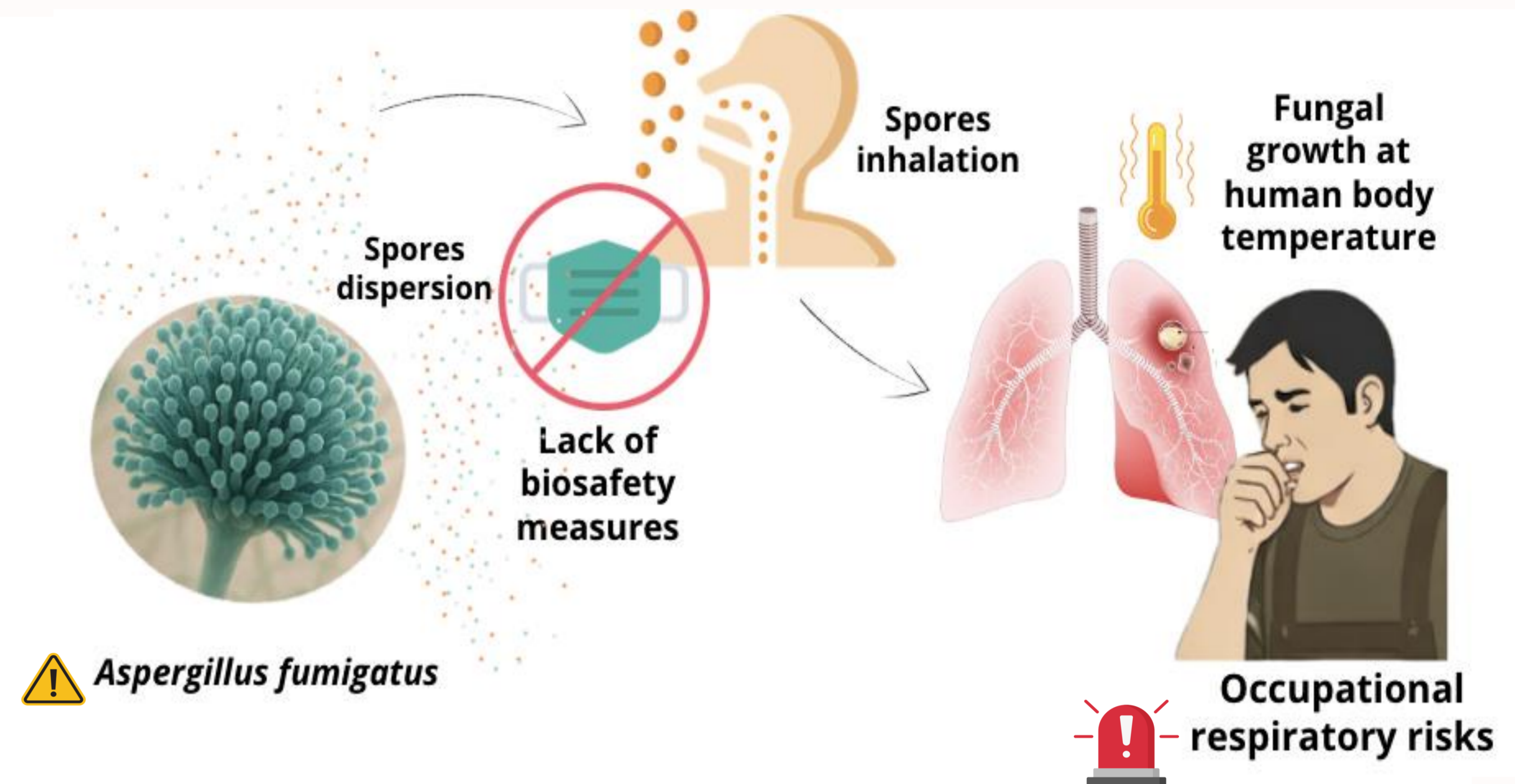
³ Faculdade de Motricidade Humana, Universidade de Lisboa, Instituto de Saúde Ambiental (ISAMB), FMUL

⁴ NOVA National School of Public Health, Public Health Research Centre, Comprehensive Health Research Center, CHRC, NOVA University Lisbon, Lisbon, Portugal

E-mail address: bg7@edu.ulisboa.pt

Introduction

- Poultry farms are conducive environments for *Aspergillus fumigatus* [1].
- *Aspergillus fumigatus* is a major pathogen and the main **causative agent of respiratory diseases** [1].
- *A. section Fumigati* species can grow at human body temperature, a key indicator of **pathogenic potential** [2].
- The occurrence of thermotolerant *Aspergillus* section *Fumigati* in poultry farms remains few explored [3]
- Workers' awareness of fungal hazards is poorly characterized [4,5].



Objective:

This study aims to assess both, thermotolerant *Aspergillus* section *Fumigati* prevalence and worker awareness of microbial risks in poultry farming.

Methods:

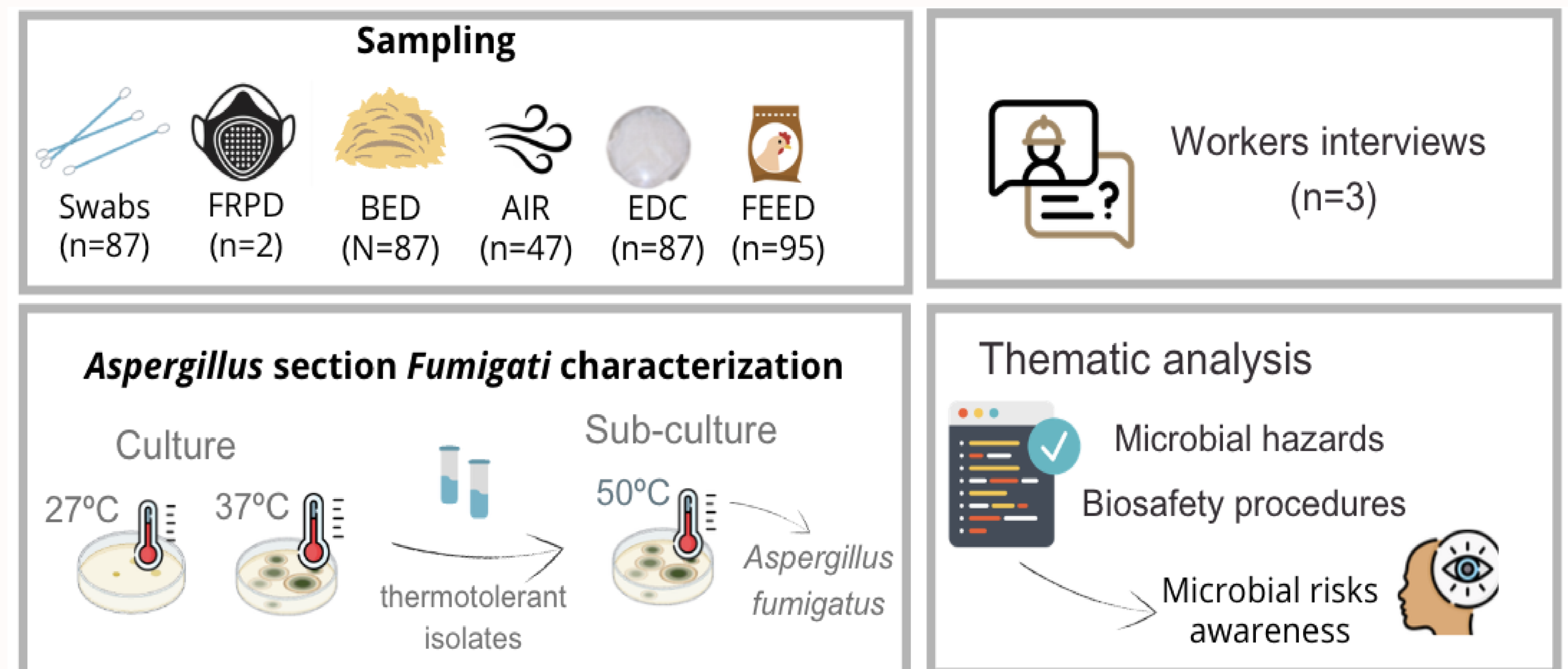


Figure.1 – Methodological strategy

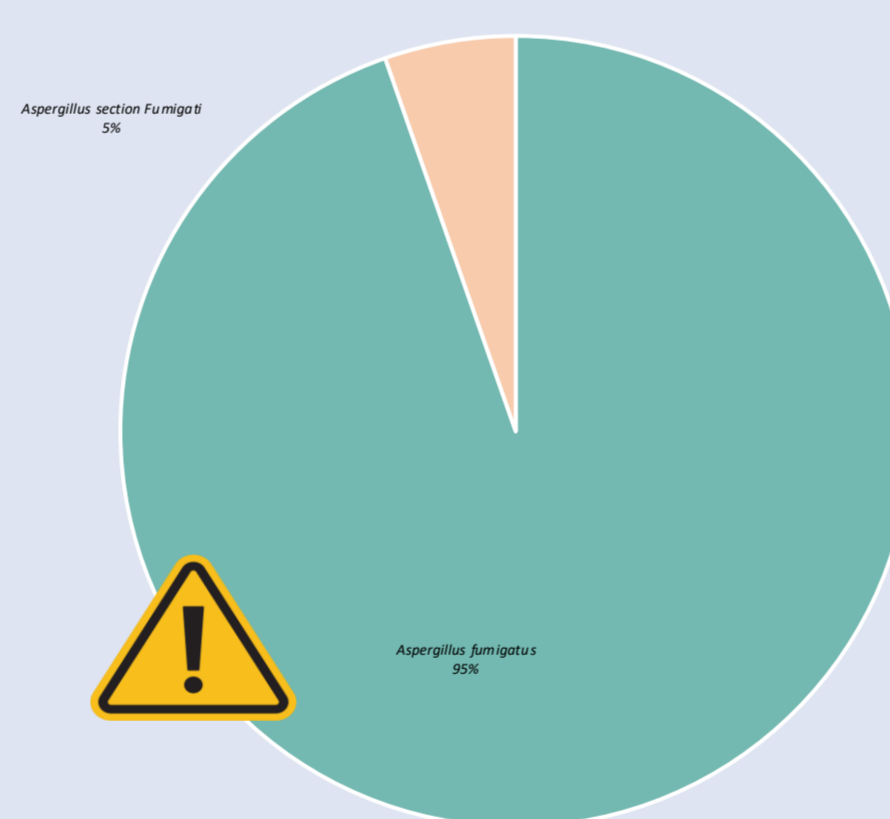
Results and discussion

Fungal characterization

Table.1- *Aspergillus* section *Fumigati* detection

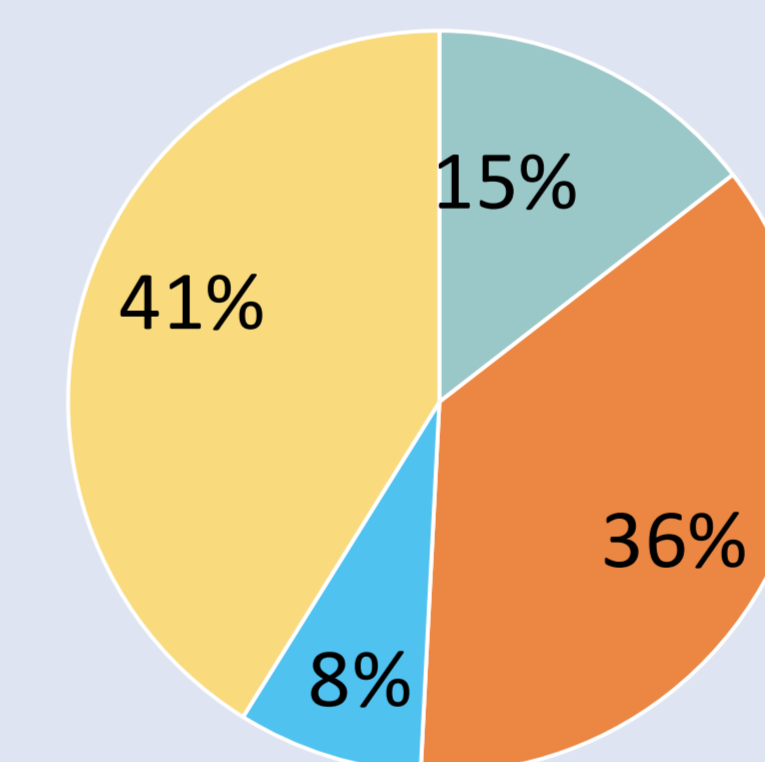
	Environmental (27°C)	Thermotolerant (37°C)
AIR	34.04% (16/47)	68.09% (32/47)
EDC	17.24% (15/87)	100% (87/87)
BED	4.59% (4/87)	100% (87/87)
SWABS	17.24% (15/87)	100% (87/87)
FEED	9.47% (9/95)	98.95% (94/95)
FILTER MASKS	0% (0/2)	50% (1/2)
TOTAL	14.57% (59/405)	95.80% (388/405)

Isolates
Sub-culture (50°C)



- Thermotolerant *Aspergillus* section *Fumigati* was found in 96.25 % (388/405) of samples, indicating **widespread presence of potentially pathogenic species** in poultry farms [6].
- From the 168 isolates of *A. section Fumigati*, 159 were identified as *Aspergillus fumigatus sensu stricto* (94.64%) and 41 (25.79%) in air samples), suggesting **increased occupational exposure risks** [7,8]

Thematic analysis



- Microbial hazards
- Contamination sources
- Contamination risks
- Biosafety measures

Figure.2 – Distribution (%) of thematic categories derived workers interviews (n=3)

- Biosafety measures were highly explored (41.13%, 51/124), and focused on pavilions management and pest control.
- Respiratory protection was rarely mentioned (5.88%, 3/51), suggesting **limited awareness of airborne exposure risks** [3,4].
- Microbial hazards were mainly focused on bacteria and viruses, (14.5%, 18/124), highlighting that **fungal pathogens are still a neglected concern** [3,7].

Conclusions

- ✓ Poultry farms constitute a relevant source of pathogenic fungi.
- ✓ Workers limited use of respiratory protection, increasing occupational exposure risks.
- ✓ Low perception of fungal hazards can undermine the adoption of biosafety practices.

Recomendations



Strengthen multisectoral collaboration to support capacity-building initiatives to reduce occupational exposure risks



Establish surveillance programs targeting fungal pathogens in poultry production



Promote education and training programs on fungal hazards and biosafety practices

Acknowledgments: This Phd was supported by national funds through FCT- Fundação para a Ciência e Tecnologia, I.P., by the project UI/BD/153746/2022, <https://doi.org/10.54499/UI/BD/153746/2022> and CE3C unit UID/00329/2025, <https://doi.org/10.54499/UID/00329/2025>. It is also supported by FCT/MCTES and H&TRC, UIDP/05608/2020 (<https://doi.org/10.54499/UIDP/05608/2020>) and UIDB/05608/2020 (<https://doi.org/10.54499/UIDB/05608/2020>) and also by Instituto Politécnico de Lisboa, Lisbon, through IPL/IDI&CA2023/ASPRisk_ESTeSL

