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Bioaerosol occurrence and transmission of antimicrobial resistances in pig husbandry

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Dust can contain microorganisms that are both pathogenic and resistant to antimicrobials (AMR), which can potentially transmit airborne infectious and zoonotic diseases. Agriculture is one of the largest producers of primary particle matter, accounting for approximately 20% of global fine dust emissions. The tenacity of aerosolised pathogens depends on the characteristics of the particles, such as size and mass density, and the resilience of the pathogens to environmental factors. Aerosols from and inside animal barns are being investigated as a potential source of airborne pathogens. While it is known that the use of antibiotics in agriculture often results in antibiotic-resistant bacteria, the extent to which environmental factors can alter the bacterial composition of bioaerosols, and the associated risks to humans and the environment, remain open research questions. In AirBarn, the size and density of fine dust particles in pig barns will be measured. The prevalence of pathogenic microorganisms on airborne particles and the occurrence of antibiotic resistance will be investigated. Assuming that the abundance of AMR bacteria in bioaerosols varies depending on environmental conditions (temperature and humidity), we will use microscopy, bacterial cultivation, next generation sequencing and PCR/qPCR analysis to analyse bioaerosols, in particular the abundance of ESKAPE bacteria, in the pig barns. The aim is to improve our understanding of the aerobiology of pathogen-containing aerosols on pig farms.

Keywords

dust, airborne transmission, AMR, ESKAPE

Registration ID

OHS25-67

Professional Status of the Speaker

Graduate Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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