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Prevalence of antimicrobial resistance bacteria in dust from piglet farms.

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Dust can contain microorganisms that are both pathogenic and resistant to antimicrobials (AMR), which can potentially transmit airborne human pathogenic bacteria. Agriculture is one of the largest producers of primary particle matter, accounting for approximately 20% of global fine dust emissions. 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 AMR containing bioaerosols, and the associated risks to humans and the environment, remain open research questions. In this study aerosols from and inside animal barns were investigated and both the size and density of fine dust particles in pig barns was measured. During summer a higher abundance of fine particles was seen, compared to winter. The prevalence of pathogenic microorganisms on those airborne particles was visualized and showed mature biofilm. Those biofilms consisted of more than 500 species and both gram-negative and gram-positive bacteria were found on dust, independent of the seasonality. Interestingly there was a strong correlation between AMR gene abundance and ESKAPE bacteria in air during winter compared to summer.

This study provides a strong insight into the composition of dust associated bacteria and shows the potential risk for humans and the environment.

Keywords

airborne transmission, AMR bacteria, piglets, dust

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Professional Status of the Speaker

Postdoc

Junior Scientist Status

No, I am not a Junior Scientist.

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