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Effective AMR detection in the veterinary sector

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Bacterial infections in the veterinary sector pose significant health and economic challenges, exacerbated by the rise of antimicrobial resistance (AMR). Recent efforts to reduce antibiotic use in animals, driven by increased awareness and regulatory measures, have led to a rise in preventive measures. However, antibiotics and antimicrobial susceptibility testing (AST) remain essential for treating infections. Technologies like Bruker's MALDI Biotyper®, IR Biotyper® and MICRONAUT panels are crucial for rapid microbial identification and effective AST, ensuring appropriate and quick decisions.

Bacterial infections in the veterinary sector are a significant concern, affecting livestock, pets, and wildlife. These infections can lead to severe health issues and economic losses. The rise of antimicrobial resistance (AMR) has compounded these problems, making it harder to treat infections effectively. AMR is a critical challenge, impacting human, animal, plant, and environmental health. In 2019, bacterial AMR was responsible for approximately 1.27 million human deaths globally.[1]

Recent developments indicate a global reduction in the use of antibiotics in animals, driven by increased awareness and regulatory measures. Many countries have implemented national action plans to address AMR, focusing on responsible use strategies and enhancing prevention measures. The animal health sector has seen a rise in the use of vaccines and other preventive products, reducing the reliance on antibiotics.[2] However, antibiotics remain essential for treating diseases that evade preventive measures, and so does antimicrobial susceptibility testing (AST).

Bacterial infections in animals pose a significant threat to public health, particularly through zoonotic diseases that can be transmitted from animals to humans. Approximately 75% of emerging infectious diseases are zoonotic, emphasizing the need for a One Health approach that integrates human, animal, and environmental health.[3]

Appropriate technologies are crucial for detecting bacterial infections and performing AST in the veterinary sector. Phenotypic AST, including broth microdilution, gradient diffusion, and disk diffusion methods, remains the gold standard for determining suitable antimicrobials. These methods provide minimum inhibitory concentration (MIC) values or zone diameter data, guiding effective treatment decisions.

A recently published study showed an increasing trend of antimicrobial resistances to numerous important antimicrobials for human medicine over the years from 2013-2019, concluding that sources and risk factors supporting this trend need to be identified.[4]

Another study looking into the prevalence and resistances of *E. coli* isolated from raw cow's milk found that more than a quarter of the isolates displayed a multidrug-resistant antibiogram.[5] This highlights the importance of proper surveillance and monitoring measures for this potential zoonotic reservoir. Here the bacterial identification step was performed by MALDI-TOF mass spectrometry using Bruker's MALDI Biotyper, which offers rapid and cost-effective microbial identification with a very simple sample preparation workflow. For the assessment of AMR in the identified microbes Bruker's MICRONAUT portfolio provides three panels for the veterinary sector, covering gram-negative and gram-positive bacteria, isolated from companion animals, horses, cattle, swine as well as bovine mastitis cases. Based on the broth microdilution (BMD) procedure, the reference for AST, MICRONAUT provides species-specific true MIC values for a broad spectrum of veterinary-specific antibiotics and complies with latest CLSI VET standards.

References

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