

ANTIMICROBIAL RESISTANCE IN *PASTEURELLACEAE* FROM CATTLE HERDS WITH ENDEMIC BRONCHOPNEUMONIA

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Introduction

Pasteurellaceae are important causes of pneumonia in cattle and antimicrobials are widely used to control these infections. To date, little information on antimicrobial resistance in *Pasteurellaceae* from herds with endemic, often subclinical, bronchopneumonia is available.

Aim

The objective of the present study was to determine antimicrobial susceptibility of *Pasteurella multocida*, *Mannheimia haemolytica* and *Histophilus somni* isolated from dairy and beef herds with endemic, often subclinical, bronchopneumonia.

Materials and methods

- Non-endoscopic broncho-alveolar lavage (BAL) samples
- February - July 2017
- 60 Flemish herds (28 dairy, 27 beef, 5 mixed)
- BAL fluid:
 - Bacterial culture
 - Antimicrobial susceptibility testing for 10 antimicrobials (ampicillin 10 µg, ceftiofur 30 µg, tetracycline 30 µg, enrofloxacin 10 µg, penicillin 10 U, florfenicol 30 µg, tylosin 150 µg, trimethoprim 5 µg, sulfonamides 240 µg (Neo-Sensitabs™) and tulathromycin 30 µg (BD BBL™ Sensi-Disc™)
 - CLSI standardized disk diffusion (CLSI 2013, 2015), clinical breakpoints
- One isolate per species per farm was used for antimicrobial susceptibility testing.
- Multiresistance was defined as resistance to 2 or more of the antimicrobials tested for each pathogen.

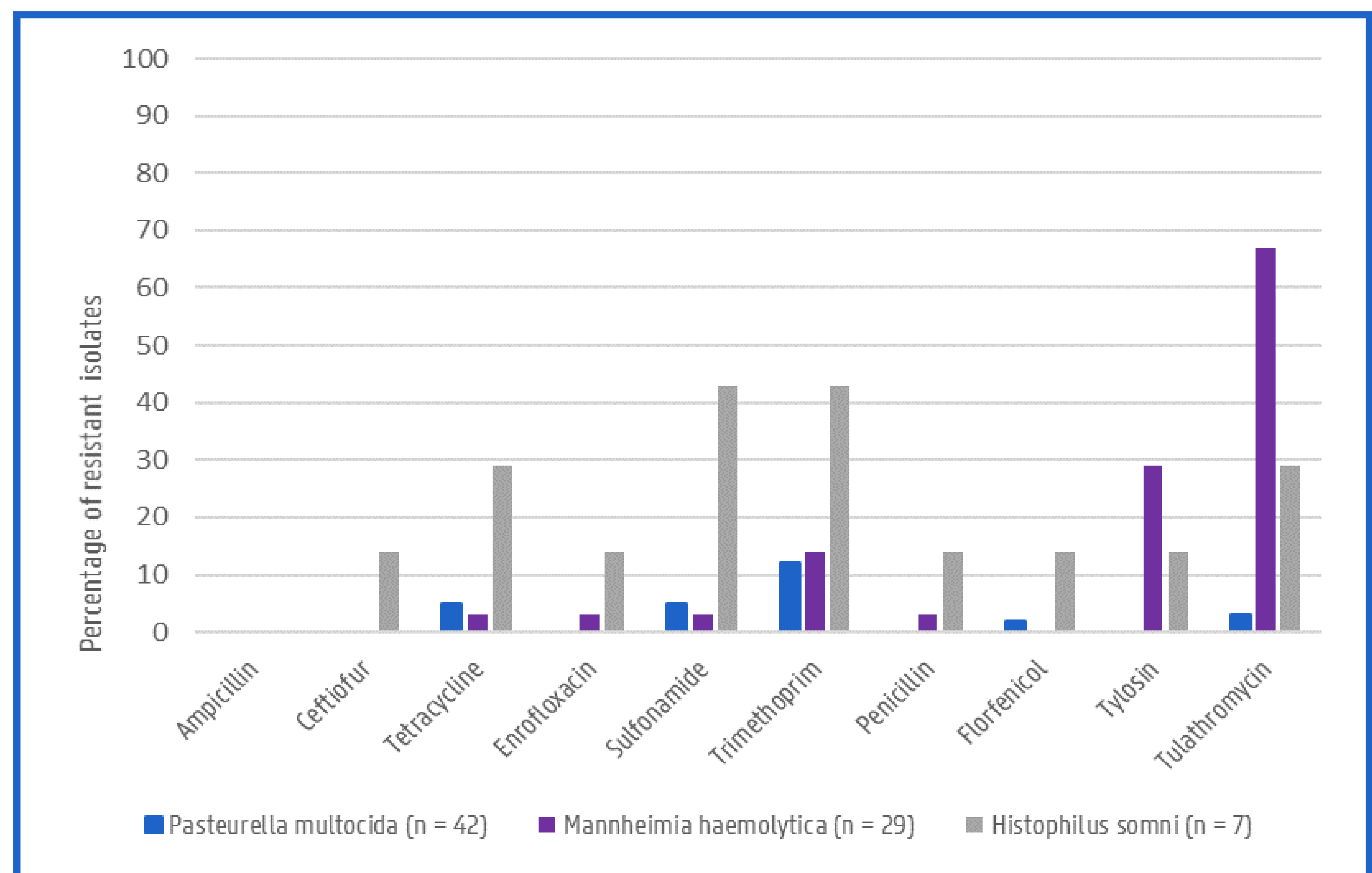


Figure 1: Antimicrobial resistance on farm level per isolate tested by disk diffusion. Isolates were defined as resistant according to Clinical and Laboratory Standards Institute recommendations (CLSI 2013, 2015).

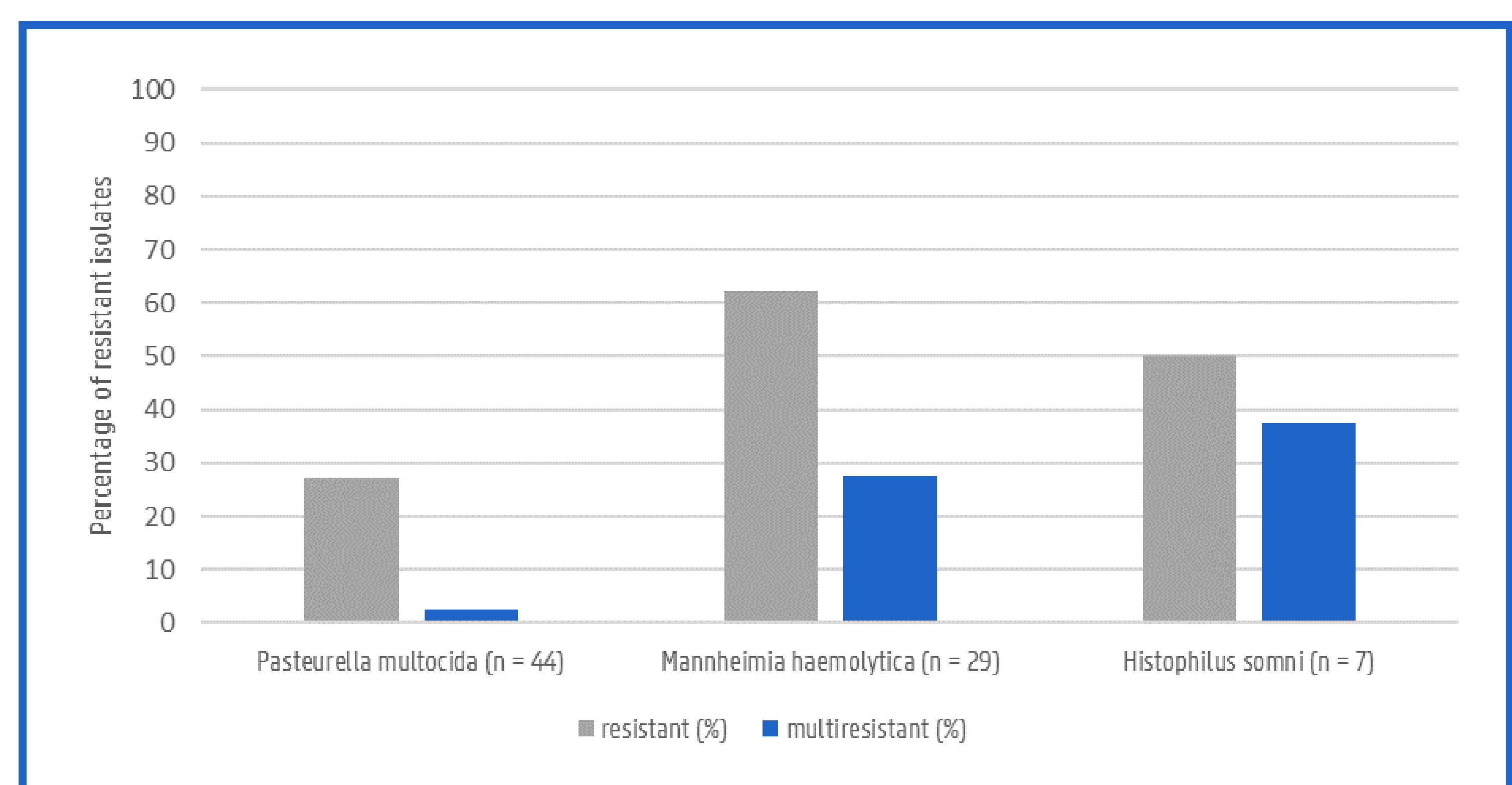


Figure 2: Prevalence of (multi)resistance on herd level.

Results

Pasteurella multocida (n=44), *Mannheimia haemolytica* (n=29) and *Histophilus somni* (n=7) were isolated from 73%, 48% and 12% of the herds, respectively. Mixed infections were present in 43,3 % (26/60) of the herds mainly consisting of co-infection with *P. multocida* and *M. haemolytica* (30% of the herds, n=18) followed by co-infection of *P. multocida* and *H. somni* (8.3% of the herds, n=5). Co-infection of *M. haemolytica* and *H. somni* was present in 3,3% (n=2) of the herds and in one of the herds all of the pathogens mentioned above could be isolated. From 15% (9/60) of the herds no *Pasteurellaceae* could be isolated. Antimicrobial resistance levels for each pathogen and (multi)resistance on herd level are shown in figure 1 and 2.

Conclusion

Compared to the historical reference data on healthy animals¹ and national monitoring data on diseased animals² (multi)resistance in *Pasteurellaceae* has increased.

In Flemish herds with endemic, often subclinical, pneumonia antimicrobial resistance levels are low for *P. multocida* in contrast to *M. haemolytica* and *H. somni* where macrolide resistance is more common.

1. Catry, B. *et al.* Variability in Acquired Resistance of *Pasteurella* and *Mannheimia* Isolates from the Nasopharynx of Calves, with Particular Reference to Different Herd Types. *Microb. DRUG Resist.* 11, (2005).
2. Dierengezondheidszorg Vlaanderen (DGZ). Antibioticaresistentie bij pathogene Kiemen geïsoleerd bij rundvee. Evolutie resistentie periode 2013 – 2017.