Effect of different oral oxytetracycline treatment regimes on selection of antimicrobial resistant coliforms in nursery pigs

A major concern derived from using antimicrobials in pig production is the development of resistance. This study aimed to assess the impact of selected combinations of oral dose and duration of treatment with oxytetracycline (OTC) on selection of tetracycline resistant (TET-R) coliforms recovered from swine feces. The work encompassed two studies: 1) OTC 5 mg/kg and 20 mg/kg were administered to nursery pigs for 3 and 10 days, respectively, under controlled experimental conditions, and 2) 10 mg/kg, 20 mg/kg and 30 mg/kg OTC were given to a higher number of pigs for 6, 3 and 2 days, respectively, under field conditions. Statistical modeling was applied to analyze trends in the proportion of TET-R coliforms. In the experimental study, no statistical difference in proportion of TET-R coliforms was observed between treatments at the end of the trial (day 18) and compared to day 0. In the field study, treatment had a significant effect on the proportion of TET-R bacteria two days after the end of treatment (2dAT) with the regimes "low dose-six days" and "medium dose-three days" yielding the highest and lowest proportions of TET-R strains, respectively. No indication of co-selection for ampicillin- and sulphonamide-R bacteria was observed for any treatment at 2dAT. By the end of the nursery period, the proportion of TET-R bacteria was not significantly different between treatments and compared to day 0. Our results suggest that similar resistance levels might be obtained by using different treatment regimes regardless of the combinations of oral dose-duration of treatment.

General information
Publication status: Published
Organisations: Department of Applied Mathematics and Computer Science, Dynamical Systems, Office for Study Programmes and Student Affairs, University of Copenhagen, Danvet K/S
Contributors: Fresno, A. H., Zachariasen, C., Norholm, N., Holm, A., Christiansen, L. E., Olsen, J. E.
Number of pages: 7
Pages: 1-7
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Veterinary Microbiology
Volume: 208
ISSN (Print): 0378-1135
Ratings:
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.7 SJR 1.175 SNIP 1.241
Web of Science (2017): Impact factor 2.524
Web of Science (2017): Indexed yes
Original language: English
Keywords: Antimicrobial resistance, Co-selection, E. coli, Oxytetracycline treatment regime, Pig, Journal Article
DOIs: 10.1016/j.vetmic.2017.07.005
Source: FindIt
Source ID: 2373679817
Research output: Contribution to journal › Journal article – Annual report year: 2017 › Research › peer-review