The relationship between antimicrobial use and herd level mortality as a welfare indicator in veal calves.

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Abstract

The veal calf industry urgently needs to reduce antimicrobial use (AMU). A huge challenge, since this industry holds major risk factors for disease (e.g. young age, commingling, transport stress). As a result, fear is that a rapid decrease would increase mortality and therefore hamper animal welfare. This study explored the relationship between AMU and mortality in two major veal calf companies (integrations). Total AMU and different classes, including critically import antibiotics, were added to the model. The secondary objective was to determine risk factors for mortality. A retrospective cohort study was performed on electronically collected antimicrobial consumption and mortality data from the largest Belgian veal practice in the period 2014-2016. A mixed linear model was built to identify factors associated with mortality. The data consisted of 76 production cycles from 29 different farms managed by two integrations (1 and 2), covering 45,001 dairy veal calves. Average AMU was 30.1 defined daily doses for animals per year (DDDvet/year, standard deviation ± 10.4), and was significantly higher in integration 2 (35.9 DDDvet/year ± 9.3) compared to 1 (22.4 ± 5.7). In contrast, integration 2 had significantly lower mortality than integration 1 (2.3% ± 1.4 vs 4.1% ± 1.4). Analysis showed a positive association between AMU and mortality in production cycles of integration 1 and no association at all in integration 2. In the final multivariable model, the mortality risk increased with an increasing herd size and with the use of 3rd/4th generation cephalosporins. Whereas mortality risk decreased with an increased use of long-acting macrolides. This study shows that at the current levels of total and critically important AMU in Belgian dairy veal calves, a decreasing use was not associated with increased mortality. In contrast, in the veal company with the lowest AMU, a positive association with mortality was observed. These data suggest that no welfare issue was induced so far and that selection of appropriate antimicrobial therapy by the veterinarian as well as identification of the veal company as an influencer of AMU and mortality will be crucial to further rationally reduce AMU in veal calves.
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