

A scoping review of the peer-reviewed literature in human populations and in vitro for potential non-antimicrobial interventions to reduce antimicrobial resistance in cattle

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Introduction

Scoping reviews are used to evaluate the extent and nature of existing literature. Our goals in this scoping review were to broadly map interventions or factors associated with antimicrobial resistance (AMR), to identify potential areas for application, and to highlight research gaps. This part of the review attempted to identify non-antimicrobial interventions in human populations or in vitro.

Materials and Methods

Literature databases were searched for non-antimicrobial interventions or factors potentially associated with AMR. Eligibility screening of each abstract and full text reference was performed independently by 2 reviewers. Interventions were broadly categorized and the impact on AMR (increase, decrease, or none) was determined.

Results

The searches returned 23,594 references, and 2,191 full-text references were retained because they meas-

ured interventions or factors that were associated with or changed the occurrence of AMR. Non-antimicrobial factors associated with a change in AMR in humans or in vitro were described in 435 references. Consolidated categories were hospital factors (n=330), patient factors (55), biocides/disinfectants (21), and other in vitro studies (29). Most studies described either no effect or an increase in AMR associated with the factor or intervention, including 289 reporting time in ICU/hospital as a risk factor for AMR. Notable exceptions in which AMR decreased included presence of an infectious disease consultation service (n=1), use of a vaccine which changed prevalence of resistant and susceptible strains (14), and gene transfer or plasmid curing (7).

Significance

This scoping review provides potential interventions and risk factors that can inform future research into interventions in cattle to reduce AMR.