



Relationship between antimicrobial usage and resistance in food-producing animals – A systematic review

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Background and Objectives

- Despite innumerable alerts about the development of resistant bacteria due to antimicrobial usage in livestock production, there is limited evidence on the magnitude of this link
- The objective was to systematically review the literature to improve our understanding of the relationship between usage of antimicrobials in livestock and the development of antimicrobial resistance in animals and humans
- Moreover, knowledge gaps to be addressed in the future will be identified

Material and Methods

- Initially, a protocol was developed, in which populations, outcomes and interventions of interest were defined
- An exhaustive list of search terms was created for the electronic search which was conducted in four databases (Fig.1)
- A search verification was performed by contacting experts and through a manual search of relevant references
- All included references were screened at title and abstract level by two independent reviewers

Criteria used for study inclusion/exclusion

Type of literature/research:

Primary research published in peer reviewed journals, conference proceedings, national reports and academic theses

Languages:

English, German, French, Spanish, Portuguese, Italian, Dutch, Danish, Swedish, Norwegian

Animal species:

Cattle, swine and poultry

Bacterial species:

E. coli, *Enterococcus (E.) faecium*, *E. faecalis*, *Salmonella spp.*, *Campylobacter (C.) coli*, *C. jejuni* and Methicillin resistant *Staphylococcus aureus* (MRSA)

Link between antimicrobial usage and resistance:

Assessed through statistical methods

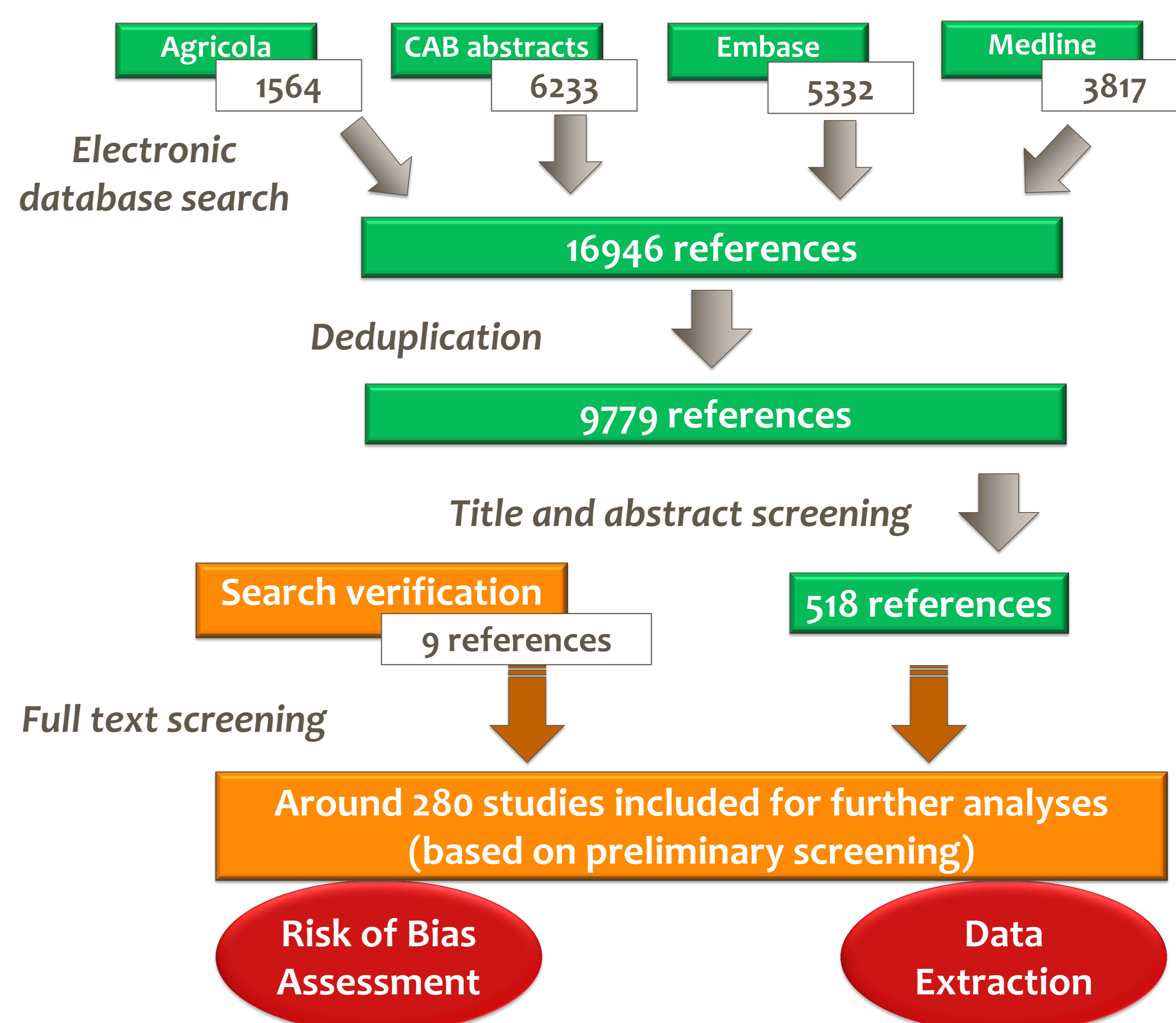


Fig. 1: Flow through the Systematic Review process.

Numbers on top represent the number of references retrieved.

Green: completed parts; Orange: in progress; Red: future steps

Status quo and future steps

- Preliminary results indicate a high heterogeneity in study designs, susceptibility tests or statistical analyses
- Future steps include risk of bias assessment and extraction of relevant data – such as study design, antimicrobial substances investigated, susceptibility test used or statistical method applied
- Extracted data will be summarized for different combinations of antimicrobial classes and animal species
- If available data are of sufficient quality, a meta-analysis will be conducted

