

Impact of the calculation method used on the observed trend in the treatment frequency in Germany

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1 Background

Antimicrobial usage (AMU) is a major driver for the spread of antimicrobial resistance (AMR). In various action plans, the need to lower AMU is addressed as an important step to tackle this issue, but efficiency of approaches taken to achieve this needs still to be assessed.

While sales data, after standardization by population correction unit (PCU), are used for comparisons of countries, more detailed data are needed to support policy-making and strengthening AMU reduction strategies on the level of individual livestock holdings.

3 Results

→ In pigs, both benchmarking values, the median and the third quartile of the farm-specific treatment frequencies, showed a decreasing trend over time.

→ Similar trends for weaned piglets (data not shown) and fattening pigs (Fig. 1)

Additional analysis showed that there was

- considerable reduction of the amount of antimicrobials used for dominating classes, no major switch to more efficacious substance classes (Fig. 1 & 2);
- reduced usage of fixed combinations, esp. sulfonamide-trimethoprim (Fig. 4);
- reduced usage of colistin (Fig. 1 & 2);
- a tendency for shorter treatment periods for sulfonamides, trimethoprim and pleuromutilins in the early implementation phase of the benchmarking (Fig. 3);
- no increased use of long acting antimicrobials, but slight increase of relative proportion for fluoroquinolones in piglets (data not shown)

→ No major changes in treatment behaviour to 'beautify' TH_{farm}

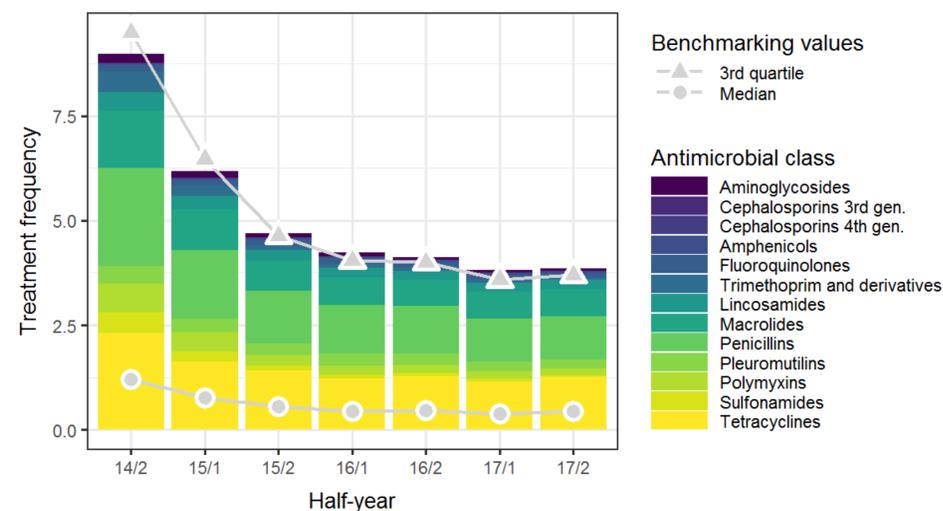


Fig. 1: Trends of the national AMU benchmarking values (median and 3rd quartile of all farm-level total treatment frequencies) and of the population-level antibiotic class-specific treatment frequencies in German fattening pigs (> 30 kg) from half-year periods 14/2 to 17/2.

2 Approach

In Germany, since July 2014, farmers have to record all antimicrobials used in fattening production animal groups by law. This includes:

- weaned piglets (pigs up to 30 kg)
- fattening pigs (pigs above 30 kg)

Usage data and animal numbers are collected on farm level. For each antimicrobial treatment, the following information is recorded:

- Name and amount of the specific drug (allows identification of antimicrobial class and combinations)
- Number of animals treated
- Duration of that treatment (number of days).

Every 6 months, a farm-specific treatment frequency is calculated for each animal production type on the farm summing up all treatments:

$$TH_{farm} = \frac{\sum[(\#animals\ treated) \times (\#treatment\ days) \times (\#antimicrobial\ classes)]}{average\ \# animals}$$

The objective of this study was to assess the impact of the calculation method used on the overall trend of the treatment frequency as regularly published. For this purpose, the usage patterns were analysed in more detail taking into account

- the antimicrobial classes applied,
- the duration of each treatment,
- the amount of the drug used for the individual treatments as well as
- the impact of changes in the selection of drugs.

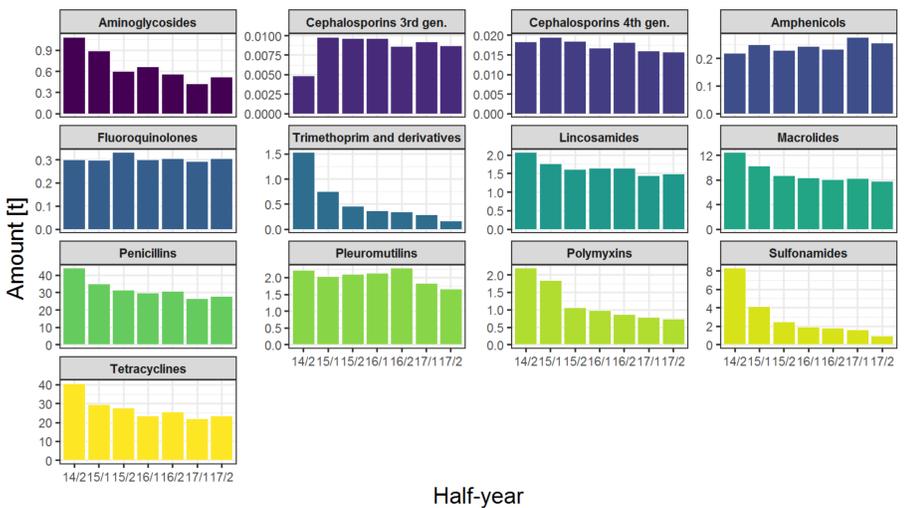


Fig. 2: Trends of the amounts of antimicrobials used in German fattening pigs (> 30 kg) from half-year periods 14/2 to 17/2. Please note that scales differ between antimicrobial classes.

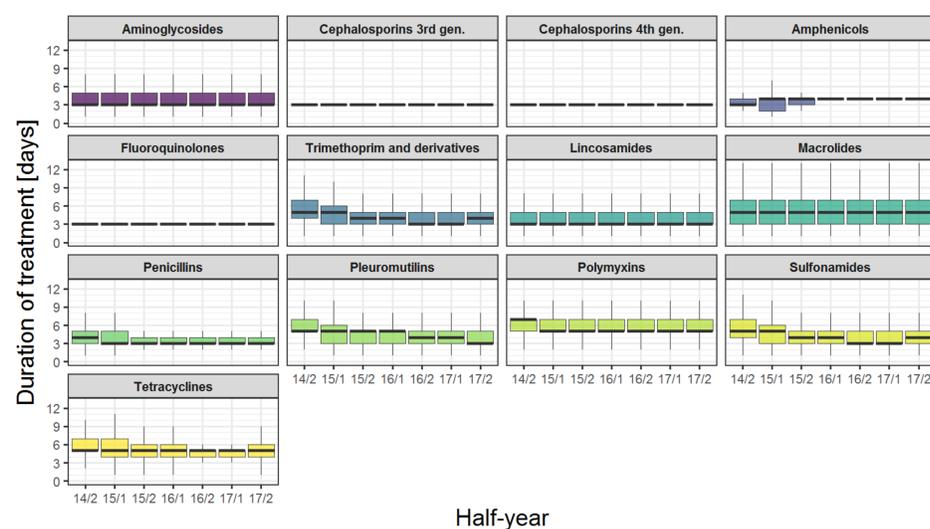


Fig. 3: Trends of the distribution of treatment duration for antimicrobials in fattening pigs (> 30 kg) from half-year periods 14/2 to 17/2.

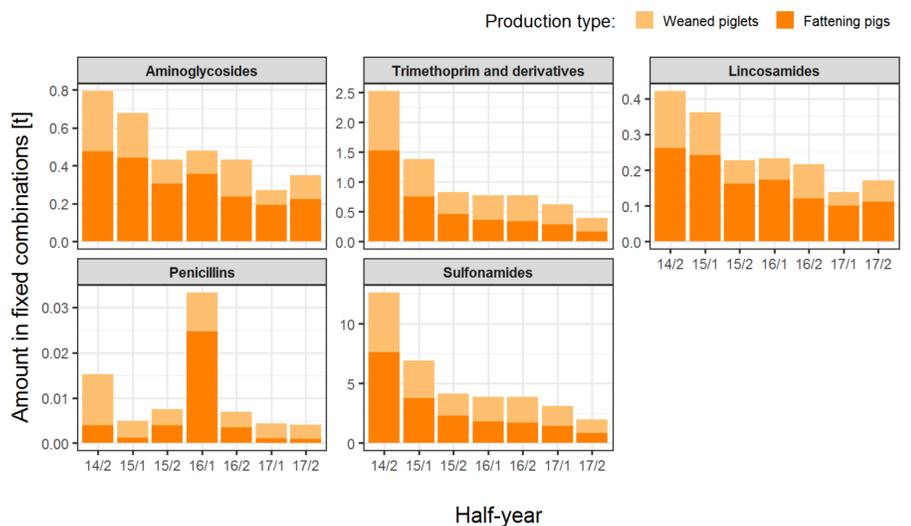


Fig. 4: Trend of the amount of antimicrobials in fixed combinations used in fattening pigs (> 30 kg) from half-year periods 14/2 to 17/2. Please note that scales differ between antimicrobial classes.

4 Conclusion

Results show there was a real reduction of both, the amount and frequency of antimicrobial use in pig production.

The calculation method precisely reflected the magnitude of AMU on farm level. The analysed data support the political discussion on how to develop the approach further as up to now, one of the criticisms raised by stakeholders is directed towards the calculation method itself as well as the handling of fixed combinations therein. Improved understanding of usage patterns will be very important for strengthening the efforts taken to further lower antimicrobial use and antimicrobial resistance rates in livestock production.



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