AMR MONITORING OF E. COLI AND ENTEROCOCCI INDICATOR BACTERIA ISOLATED FROM HEALTHY FOOD-PRODUCING ANIMALS IN BELGIUM: WHAT IS THE CURRENT SITUATION?

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Antimicrobial resistance (AMR)

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AMR monitoring in animals: healthy vs. sick

- Active
- Legal framework (Decision EU 2020/1729)
- Harmonised in Europe
- Aim:

- Monitored Resistances:

- Actors: favv afsca sciensano sciensano

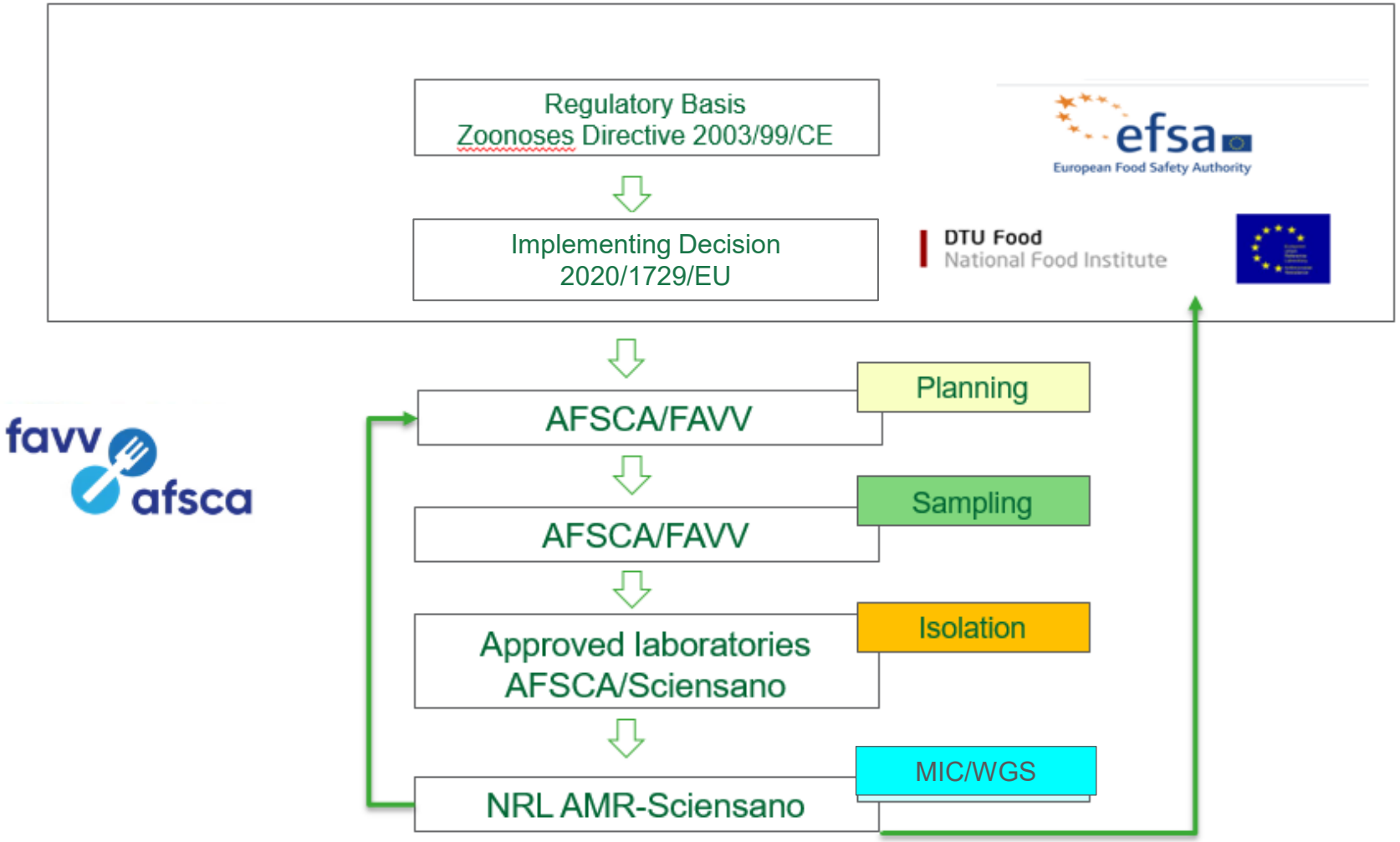
- Passive
- Diagnostic context
- Not (yet) harmonised → EARS vet
- Aim: Therapy orientation

- Monitored Resistances:

- Actors DGZ Arsia asbl MCC SAMEN VOOR GEZONDE MELK .be

& several others 1st line laboratories

Flowchart AMR-Healthy animals



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Monitoring of resistance in indicators (*E. coli* and enterococci)

- Good indicator in healthly population that provides insigth in potential reservoir of resistant bacteria
- Provides indirect information of reservoir of resistance determinants (genetic elements)
- epidemiological interest, quantifying changes and analyzing trends over time
- Surveillance of ABs of interest in Public and Animal Health

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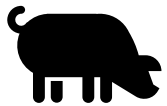
AMR monitoring in healthy animals in indicators (*E. coli* and enterococci)

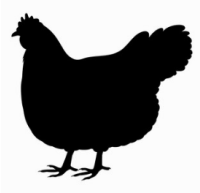
Mandatory or Voluntary
Slaughterhouse

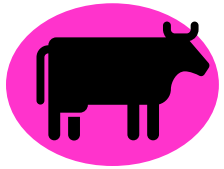


Rotation of animal categories

- ✓ Even years (2 legs)
- ✓ Uneven years (4 legs)

Voluntary
Farm





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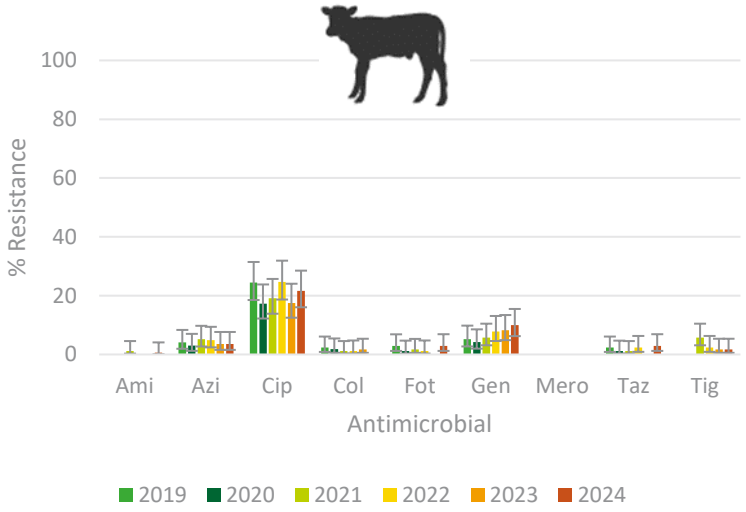
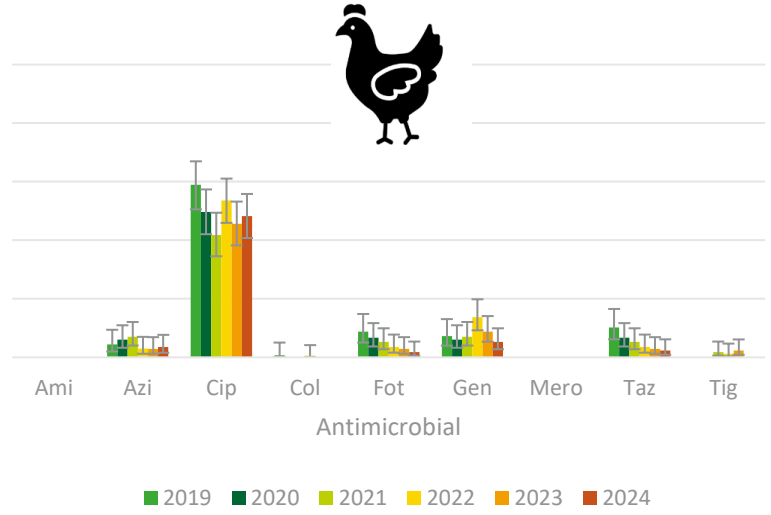
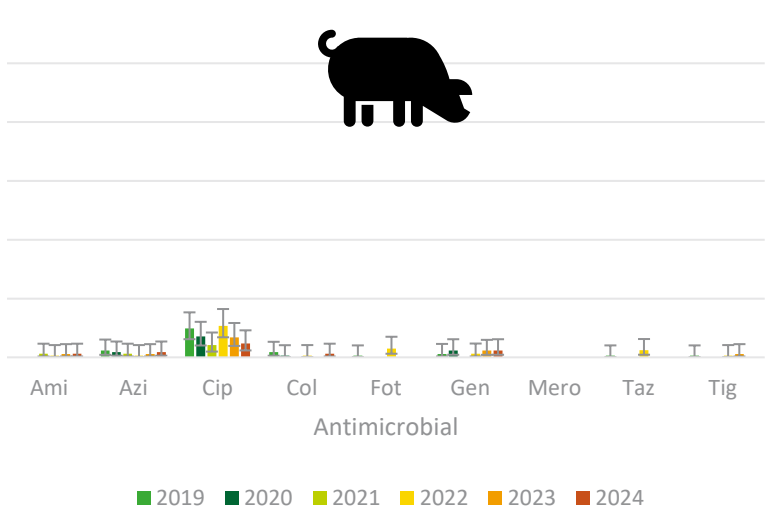
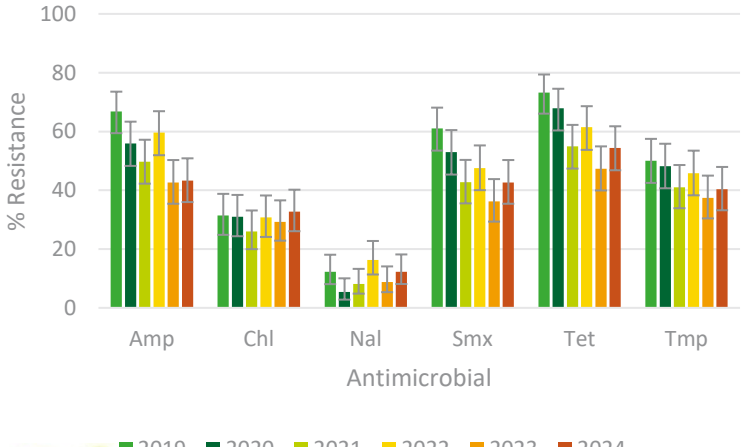
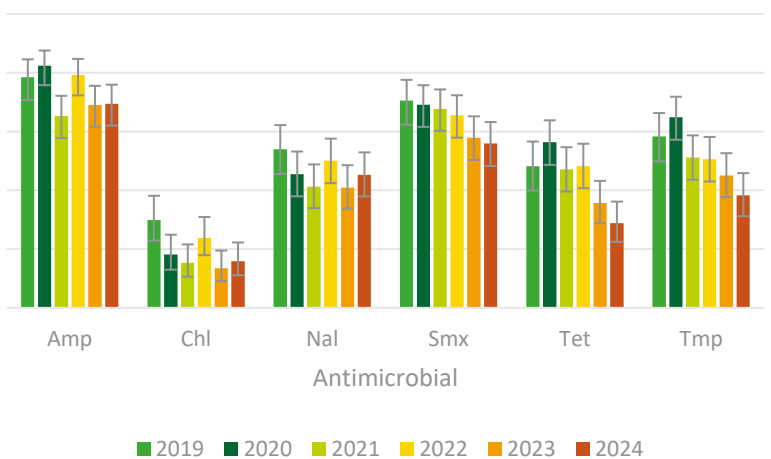
Occurrence of resistance in *E. coli* to commonly used and critical important antimicrobials in animal populations at slaughterhouse

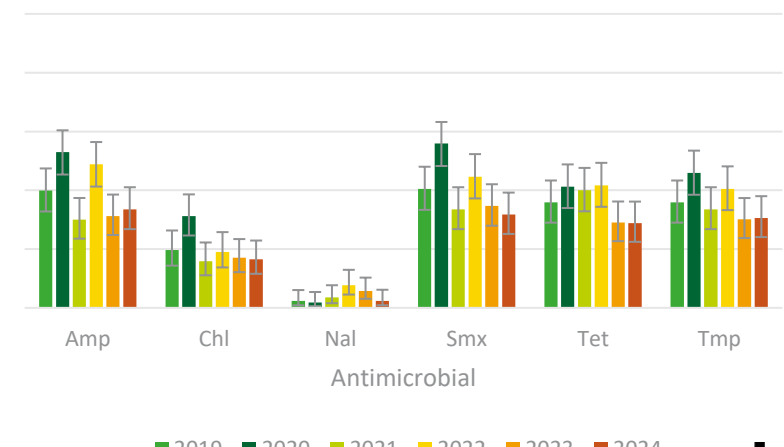












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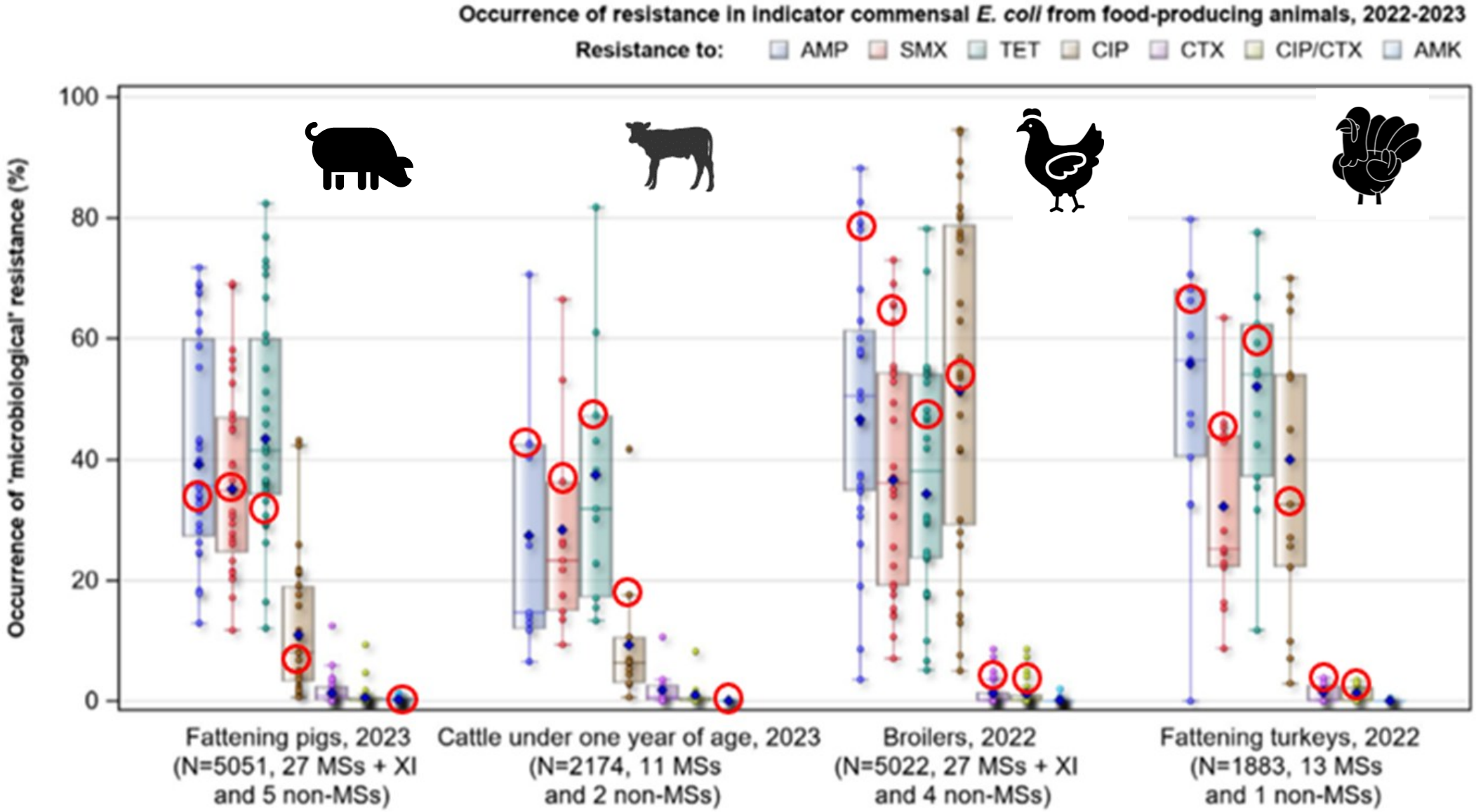
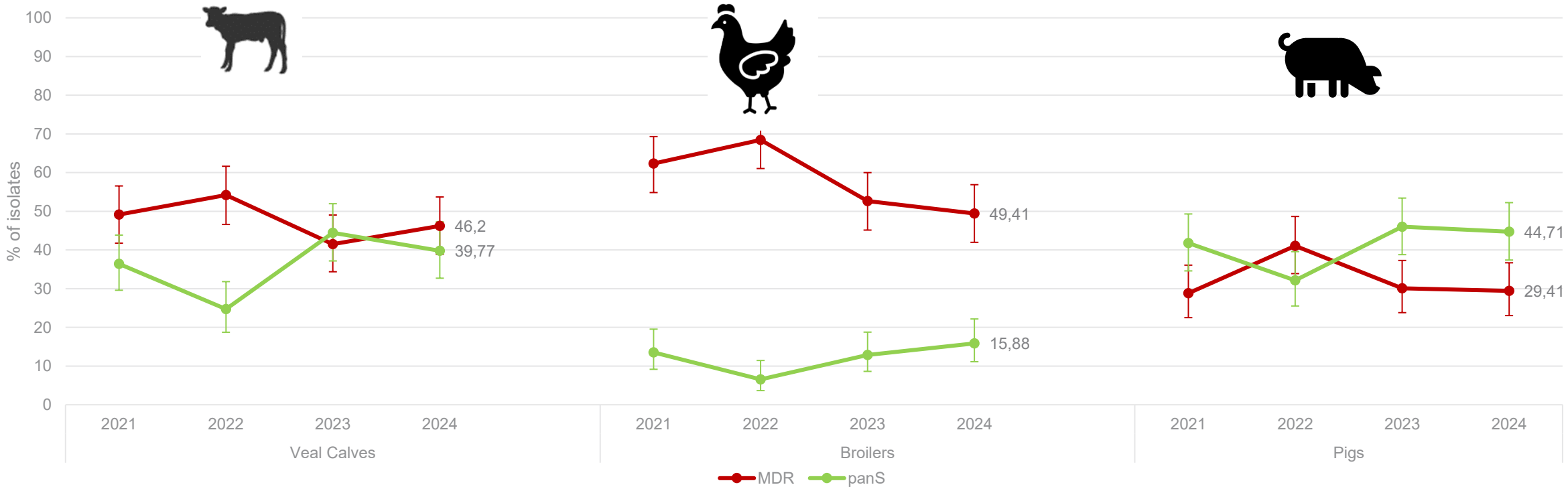
Occurrence to selected AB in indicator *E. coli* in food producing animals (EFSA report, 2022-2023)



Multidrug resistance (MDR) vs Complete susceptibility (panS) in *E. coli* from healthy animals at slaugtherhouse



AmpSmxTetTmp 14%
AmpChlSmxTetTmp 10,71%
AmpChlCipTetTmp 7,5%
AmpGenChlSmxTetTmp 6,3%

AmpCipNalTetTmp 15,5%
AmpCipNalSmx 10,71%
AmpSmx(Tet)Tmp 9,52%

AmpSmxTetTmp 20%
AmpSmxTet 18%

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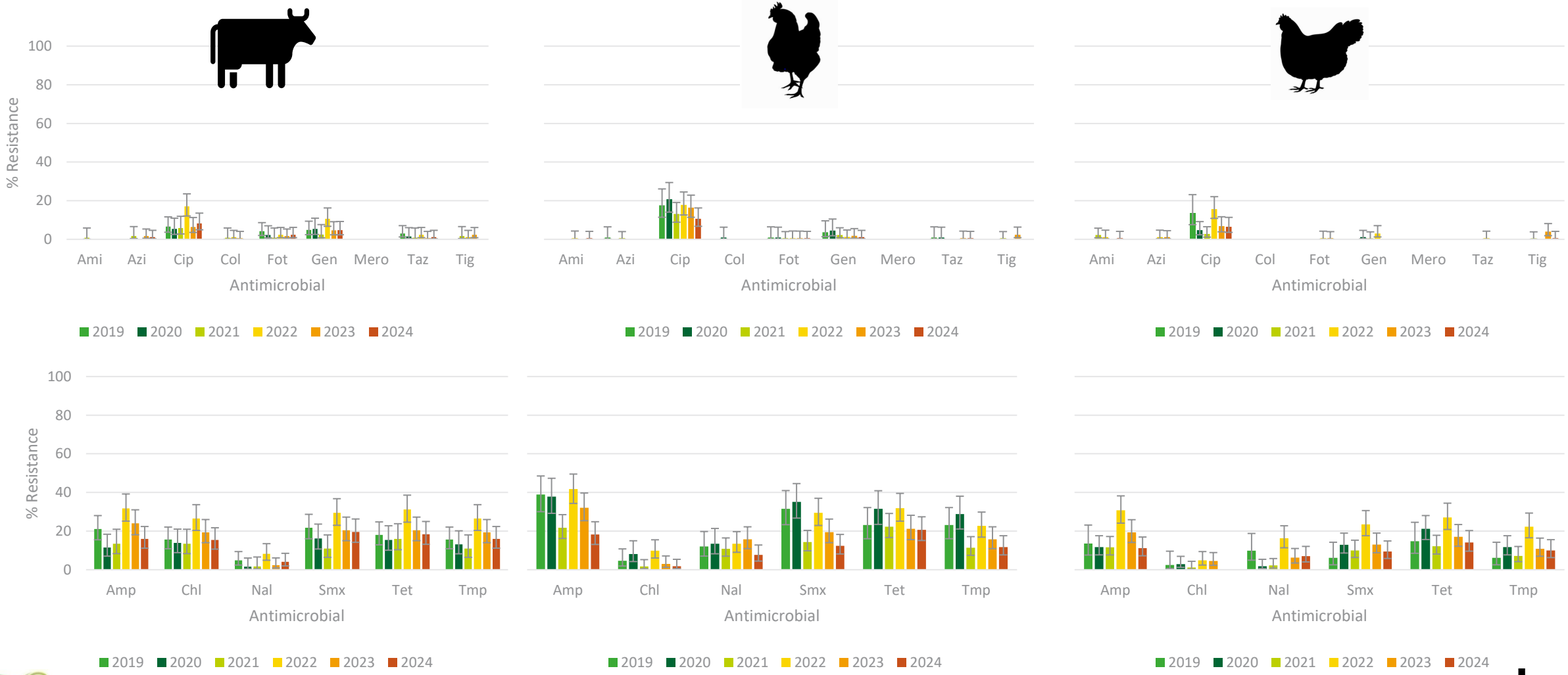
Occurrence of resistance in *E. coli* to commonly used and critical important antimicrobials in animal populations at farm



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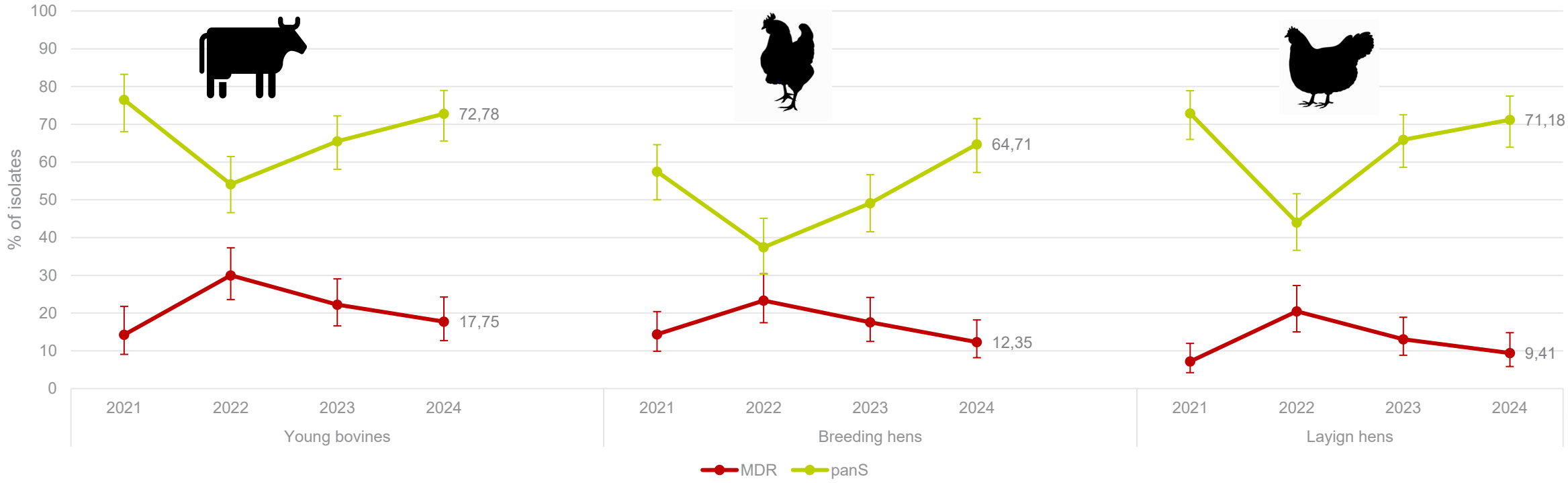
Multidrug resistance (MDR) vs Complete susceptibility (panS) on *E. coli* from healthy animals at farm



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Take home message for *E. coli*

- Resistance rates to critical antibiotics in *E. coli* remains stable without significant changes for all animal categories, both at slaughterhouse and farm level.
  - In general R to hCIA low or very low for all AB except for Ciprofloxacin (50-5%)

- In 2024, resistance rates to commonly used antibiotics slightly decreased for the 3rd consecutive year in *E. coli* recovery from poultry sampled at slaughterhouse. However in veal calves an increase has been observed for Tet et Smx

- BE data comparing to aggregated European data shows higher resistance levels for Amp, Sul, Tet and Cip, than European median for all animal categories except for isolates recovered from fattening pigs.

- CS for the second consecutive year on isolates recovered from two categories sampled at slaugtherhouse

- CS for the 3rd consecutive year has been observed in all animal categories sampled at farm

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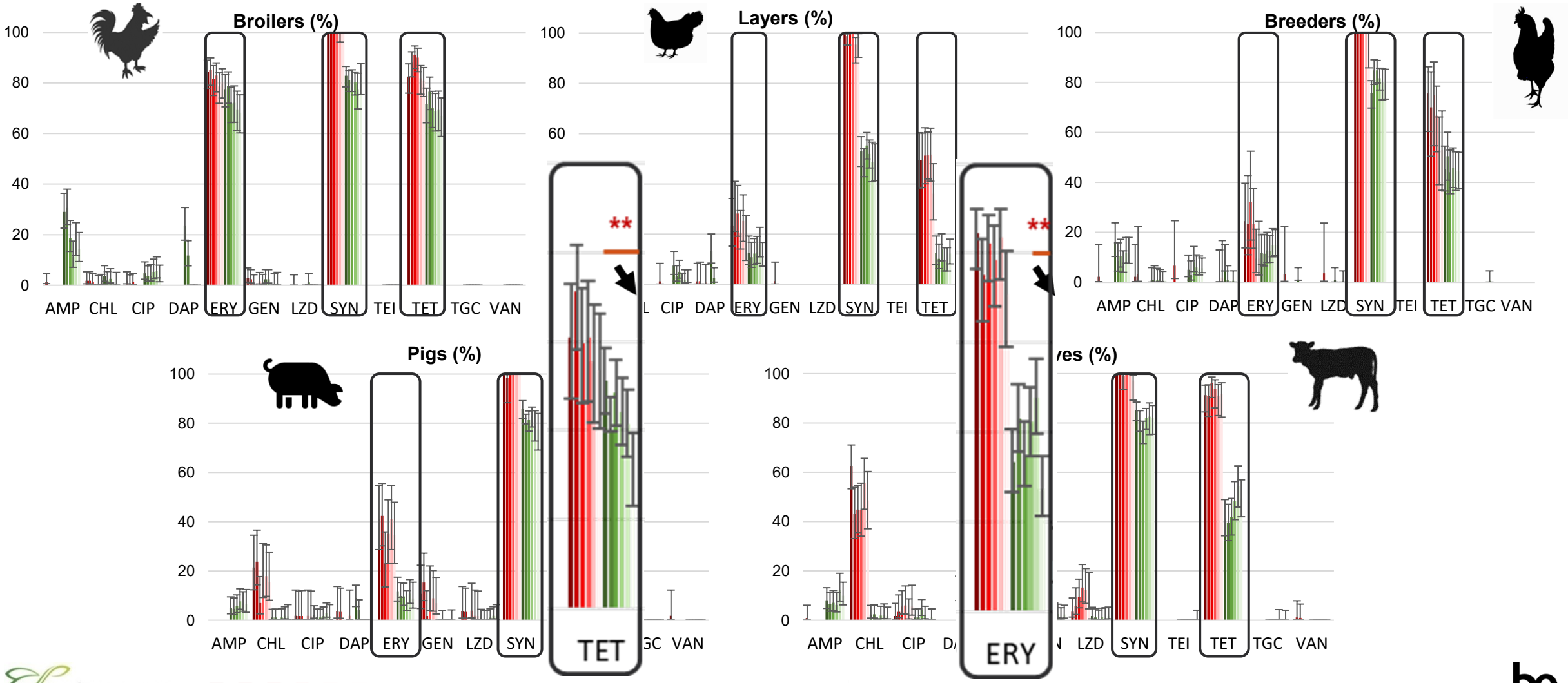
Antimicrobial resistances and trends (2019-2024): overview of enterococci



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Enterococcus faecalis in 2019, 2020, 2021, 2022, 2023 and 2024

Enterococcus faecium in 2019, 2020, 2021, 2022, 2023 and 2024

** p<0.001

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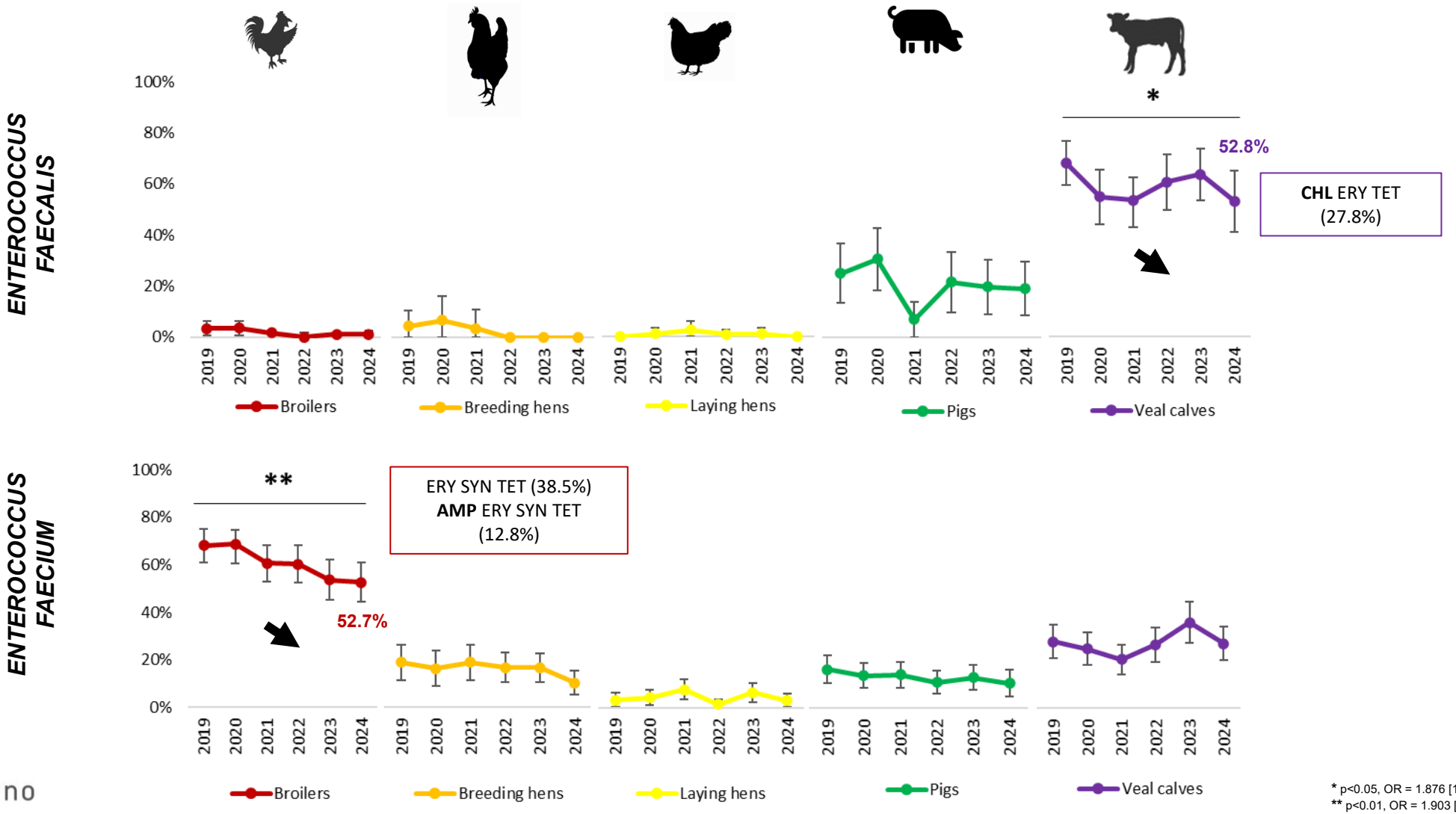
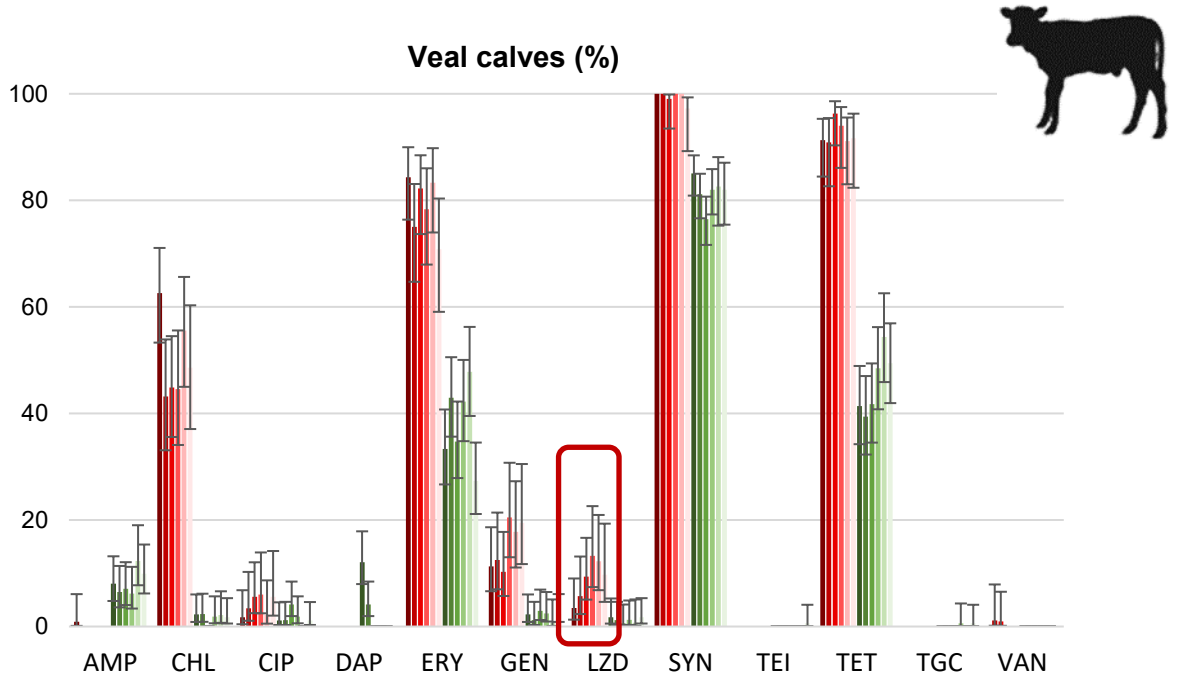
Multiresistance observed in *Enterococcus faecalis and Enterococcus faecium* per animal matrix (2019-2023)



* p<0.05, OR = 1.876 [1.024-3.437]
** p<0.01, OR = 1.903 [1.206-3.005]

Critical antibiotic resistance

- Resistance to critical AB in 2024
  - **Linezolid** : observed in *E. faecalis* and *E. faecium*, /!\ **9.7%** of *E. faecalis* isolated from veal calves **in 2024**
  - **Vancomycin** : no resistance observed since 2021
  - **Daptomycin** : low resistance observed only in *E. faecalis* isolated from breeders



Take home message for enterococci

- Resistance varies depending on
  - the animal matrix
  - the isolated bacterium (*E. faecalis* or *E. faecium*)

- The main resistances observed in enterococci in 2024 are : **ERY**, **SYN** and **TET**

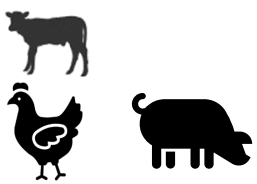
- Stable trends but significant decreases for
  - **TET** in *E. faecium* isolated from pigs (2019-2024)
  - **ERY** in *E. faecium* isolated from veal calves (2023-2024)

- Resistance to critical antibiotics in 2024
  - **Linezolid** : **low** in *E. faecalis* isolated from veal calves (**9.7**% in 2024)

- Very high multidrug resistance observed, but with **significant decreases** since 2019
  - in veal calves (*E. faecalis,* **52.8%**)
  - in broilers (*E. faecium,* **52.7%**)

Global Take home message

- General trends:
  - Stable in enterococci with the exception of 2 significant decreases
  - *E. coli*: for commonly used antimicrobials considering the period 2019-2024



Decrease trend

Stable trend

- Resistance to critical antibiotics:
  - Linezolid : to monitor closely in *E. faecalis* isolated from veal calves
  - hCIA: low to very low resistance in all animal categories

- Multidrug resistance
- Decrease of MDR for the 2nd consecutive year on *E. coli* isolates recovered from broilers and pigs at slaughterhouse
- Decrease of MDR since 2019 also in broilers (*E. faecium*) and in veal calves (*E. faecalis*)

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