Risk factors associated with Salmonella specific antimicrobial resistance: animal and meat samples

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The food system is seen as a major source of antimicrobial resistance (AMR), a threat that has led to an increase of the global burden of infectious diseases. Thus, AMR occurrence was studied in animals and derived meat from Portugal, 2014-2018. AMR surveillance data from Portugal was used. Salmonella AMR was estimated for broilers, laying hens, broiler and pig meat. AMR associated factors were studied: population, year, season, sampler, (HACCP, industry, official, official/industry). AMR occurrence in more than half isolates was assessed using a multivariate logistic regression and a backward stepwise method for each antimicrobial class model, presenting adjusted odds ratio (aOR) and 95% confidence intervals (95%CI). This study included 832 Salmonella isolates. Resistance to more than half isolates was observed to (fluoro)quinolones (broilers:52%; broiler meat:53%), penicillins (pig meat:56%), tetracyclines (pig meat:80%), sulphonamides (pig meat:62%). AMR was more likely to occur to penicillins, tetracyclines, sulphonamides in broiler meat (respectively, aOR 3.18;95%CI 1.95-5.18, 3.38;95%CI 1.27-9.19, 2.46;95%CI 1.44-4.19) and pig meat (respectively, aOR 9.39;95%CI 6.01-14.51, 53.84;95%CI 21.61-144.91, 14.58;95%CI 9.16-23.66), compared to broilers. A lesser AMR chance was observed to (fluoro)quinolones in 2017 and 2018 (respectively, aOR 0.07;95%CI 0.00-0.36, 0.13;95%CI 0.06-0.24) while a higher chance was found to tetracyclines in 2016 and 2018 (respectively, aOR 8.08;95%CI 2.25-30.74, 2.56;95%CI 1.14-6.00), compared to 2014. A higher chance for resistance was detected in spring to (fluoro)quinolones (aOR 2.32;95%CI 1.23-4.46) and penicillins (aOR 2.11;95%CI 1.20-3.78) and summer to (fluoro)quinolones (aOR 2.77;95%CI 1.46-5.35), compared to winter. These results indicate a need to reinforce biosecurity and disease prevention during spring and summer to tackle penicillins, tetracyclines and sulphonamides AMR in animal meat, but also (fluoro)quinolones in broilers.

Key messages:

- Biosecurity and prevention measures need to be reinforced during spring and summer to mitigate Salmonella AMR occurrence across the food system.
- Critical AMR occurrence to (fluoro)quinolones was found to be more associated with broilers.