Urbanization is an opportunity to lower China's livestock antimicrobial footprints

Topic: Sustainable Production and Consumption
Author: Qingling Wang
Co-Authors: Heran Zheng, Meng Li, Han Zhang

The overuse of veterinary antimicrobials has exacerbated the spread of antimicrobial resistance, posing significant threats to global public health. Livestock production is a key contributor to antimicrobial use (AMU) in China, the worldâ€™s largest producer and consumer of veterinary antimicrobials. However, responsibilities of various food consumer groups in this regard remain poorly understood. In this study, we employed a Multi-regional Input-Output (MRIO) model, the EXIOBASE database integrated with a global antimicrobial use inventory (covering chickens, cattle, and pigs), and individual consumption survey data, to quantify the antimicrobial footprints attributable to different income groups in urban and rural China from 2010 to 2020. We also quantified the footprint inequalities using the Gini coefficient and revealed contributions of different socio-economic driving factors underlying these disparities using the logarithmic mean Divisia index (LMDI) method. Results show that total antimicrobial footprints in rural China decreased by ~65% (10.8 kt) from 2010 to 2020, compared to a ~43% reduction (8.1 kt) in urban areas. Pork was the dominant contributor to antimicrobial footprints across all population groups, accounting for 64-67% in 2010 and 56-69% in 2020. The decline in antimicrobial use intensity was identified as the primary driver contributing to the observed footprint reduction. Inequality in per capita antimicrobial footprints generally decreased by ~29%, with urban-rural inequality being greater than that across income groups. Notably, population size and rising per capita demand contributed to widening the urban-rural footprint gap, while the consumption share of pork had a mitigating effect. We emphasize that urbanization is not just a demographic process (an increase in the urban share of the total population) but is also closely associated with dynamic shifts in consumerâ€™s diet components. This shift could provide an opportunity for reducing Chinaâ€™s future antimicrobial use. Further scenario analysis reveals that replacing excessive pork consumption with fish or chicken could lead to an overall footprint reduction of 47-72%. The study stresses the significant potential of urbanization and consumer-side behavioral changes in driving down Chinaâ€™s antimicrobial use in livestock production.