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Editorial

Knowledge gaps and policy needs: tackling antibiotic residue and resistance in Bangladesh's poultry sector

Md. Shafiqul Islam*

Department of Pharmacology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

*Corresponding author: Md. Shafiqul Islam, Department of Pharmacology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh. E-mail: shafiqpharma@yahoo.co.uk

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Poultry industry plays a pivotal role in socio-economic development in Bangladesh (Sumy *et al*., 2010; Alam *et al*., 2016; Islam *et al*., 2024a). Demographically Bangladesh is a country of 180 million populations. The intensification of poultry farming in Bangladesh has contributed significantly to food security, employment and economic development (Hasan *et al*., 2023). However, the widespread use of antibiotics as growth promoters and disease preventives has led to a dual crisis, antimicrobial resistance (AMR) (Hosain *et al*., 2021; Islam *et al*., 2023a; Islam *et al*., 2023b; Foysal *et al*., 2024) and antibiotic residues (Khan *et al*., 2019; Bhuiyan *et al*., 2021a; Islam *et al*., 2024b) in poultry products. The global implications of AMR declared by the WHO as one of the top 10 public health threats resonate strongly in Bangladesh, a country grappling with limited surveillance, regulatory gaps, and high antibiotic usage in livestock. The poultry industry, particularly the broiler industry, is a rapidly growing sector in Bangladesh, with significant investment from both government and non-governmental organizations (Kamruzzaman *et al*., 2021). FCR, prophylaxis and disease control, cost-benefit analysis, market value and production analyses give a very positive feedback in broiler industry in Bangladesh. However, now a day, a question arises about safe broiler production and public health hazards (Sani *et al*., 2023; Islam and Islam, 2024; Islam *et al*., 2024c).

Poultry farmers knowingly and unknowingly practiced irrational and inappropriate use of antibiotics either for prophylaxis or for the controlling of diseases or even for growth promoting benefits in broiler industry in Bangladesh (Ali *et al*., 2020; Islam *et al*., 2021; Sani *et al*., 2023). An indiscriminate and injudicious use of antibiotic (Hasan *et al*., 2021) causes antibiotic residues in broiler products and byproducts leading to MDR resistant microbes and global public health challenges (Islam *et al*., 2019; Islam *et al*., 2020; Hossain *et al*., 2021; Anaruzzaman *et al*., 2021; Bhuiyan *et al*., 2021b; Trisha *et al*., 2021). We have conducted a survey and surveillance study, awareness campaign, random sample analysis by TLC method (Islam *et al*., 2024d) in medium and small scale poultry farms in northern part in Bangladesh and found different kinds of antibiotics residues particularly in liver and kidney (Islam *et al*., 2021).

No time in hand to stop this global problem. The local and central human and livestock government sectors should organize seminars, symposia, processions, and awareness campaigns against the indiscriminate and non-judicious use of antibiotics in the human health and livestock sectors. A strong monitoring and regulating system come forward with zero tolerance about antibiotics residues in food and feed chain (Neogi *et al*., 2020; Alam *et al*., 2021). A sound farming system, alternatives to antibiotic practices, and judicious recommendations of antibiotic use from licensed doctors and practitioners could help mitigate antibiotic residue contamination in

broiler products and byproducts. The People's Republic of Bangladesh is very aware of the food safety and human health issues.

To mitigate the escalating threat of antibiotic residues and antimicrobial resistance (AMR) in Bangladesh's poultry sector, a multifaceted policy approach is essential (Uddin *et al*., 2021). Strengthening regulatory frameworks is a priority, including enforcing strict controls on the sale and use of antibiotics, banning their use as growth promoters, and ensuring they are only administered under veterinary supervision. Farmer education must be enhanced through nationwide training programs that raise awareness about AMR, proper antibiotic usage, and the importance of observing withdrawal periods. At the same time, promoting alternative practices such as the use of probiotics and herbal supplements, along with providing incentives for antibiotic-free farming, can reduce reliance on conventional antibiotics. Improving veterinary services by increasing the number of trained veterinarians, especially in rural areas, and integrating these services into public health systems will ensure more effective disease management. Establishing robust surveillance systems is also critical to monitor antibiotic usage and resistance trends, enabling timely interventions. Finally, fostering public-private partnerships with pharmaceutical companies, feed manufacturers, and other stakeholders can support responsible antibiotic use and promote the development and adoption of safer alternatives.

The emergence of AMR and antibiotics residues in Bangladesh's poultry sector poses a significant threat to public health and food security. Addressing this issue requires a multifaceted approach involving stringent regulations, enhanced farmer education, promotion of alternative practices, improved veterinary services, robust surveillance systems, and public-private collaboration. By implementing these policy measures, Bangladesh can safeguard its poultry industry and protect public health from the growing menace of antimicrobial resistance.

Ethical approval and informed consent

Not applicable.

Data availability

Not applicable.

Conflict of interest

None to declare.

Author's contribution

Conceptualization, formal analysis, writing-original draft preparation, review and editing: Md. Shafiqul Islam. The author has read and approved the final version of the published editorial.

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