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Tackling Antimicrobial Resistance for Sustainable Food Systems – How to Address the Knowledge, Practice, and Governance Gaps

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Background

Increasing antimicrobial resistance (AMR) is recognized as one of the greatest threats to global health, development, and food security. Widespread over- and misuse of antimicrobials, in combination with inadequate measures to prevent and control infections, is contributing to the global emergence of AMR.

Food systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products. Livestock and other food-producing animals constitute an integrated part of sustainable food systems. Livestock provide fertilizer (manure) for a large share of the globe's crop land and generate food from non-arable land, which globally constitutes about 25% of the land on the planet, according to current estimates. Furthermore, and most importantly, animal-source foods are rich in essential micro-nutrients, particularly for women of reproductive age and children. To optimize the use of natural resources and minimize greenhouse gas emissions, however, animals must remain healthy (Magnusson et al., 2022). Antimicrobials are important to ensuring the health, welfare, and productivity of food-producing animals. According to estimates by the World Bank Group, the decline in livestock production caused by AMR could be substantial and most pronounced in low-income countries – up to 10% in 2050 (Jonas et al., 2016). Our ability to sustainably feed and nourish a growing global population depends on our success in protecting the food systems from threats like AMR. Thus, tackling AMR is not only critical for protecting public and animal health (WHO, 2020), but also for protecting sustainable food systems.

Management of AMR in the food chain starts with primary production and continues through to consumption (FAO, 2020). Many of today's livestock-derived food systems rely on excessive antimicrobial use, which is associated with increasing risk for the emergence of drug-resistant microorganisms and antimicrobial resistant genes.

Minimizing the unnecessary use of antimicrobials in animal husbandry is a key factor in achieving national and international goals of controlling AMR and thereby sustainable food systems.

Objective of the workshop

With the target goal of Sustainable animal-derived food systems with responsible and rational antimicrobial use, the objective of this workshop was to identify solutions in different settings that can guide policy on antimicrobial stewardship. The workshop took a transdisciplinary and cross-sectoral approach, with 36 registered delegates representing 15 countries in Europe, Africa, Asia, and North America. The delegates came from academia, government agencies, private companies, and civil society, with expertise in, e.g., human, and veterinary medicine, agriculture, international development and aid, as well as disease prevention and control. The delegates had experience and knowledge of different food systems with respect to geographical, socio-economic, and cultural settings, all of which are factors that may influence how knowledge is perceived and disseminated, what measures are chosen, and the possibilities to enforce national and international policies and regulations related to antimicrobial use.

Through group discussions, the delegates identified and prioritized challenges in achieving sustainable animal-derived food systems by responsible and medically rational antimicrobial use. Thereafter they identified and discussed required actions and solutions to tackle these challenges. Each delegate was also asked to select the three suggested actions and solutions they considered most important to achieving the target goal of Sustainable animal-derived food systems with responsible and rational antimicrobial use.

Outcomes and recommendations from the workshop

Workshop delegates agreed on several prioritized actions and solutions to address challenges in tackling antimicrobial resistance to support sustainable food systems. These were divided into gaps related to knowledge, practice and governance, respectively. Below are the summarized policy recommendations put forward by the participants for the respective gaps in 1) knowledge, 2) practice and 3) governance. Please note that these recommendations are aggregated and not listed based on priority.

1) Recommendations targeting knowledge gaps:

Challenge: Livestock producers and policymakers have insufficient knowledge about prudent antimicrobial use and how to curb resistance. This may be tackled by:

1. Informing and educating stakeholders on the direct linkages between antimicrobial use and emerging AMR.
2. Empowering food producers through enhanced extension services that build trust and facilitate communication among relevant stakeholders, e.g., farmers, animal health professionals, food industry, consumers, and policymakers.
3. Increasing access to targeted information for different stakeholders on the importance of animal health and welfare for good productivity and low use of antibiotics, emphasizing disease prevention and control as means to reduce the need for, and promote the prudent use of, antimicrobials.
4. Adapting awareness-raising materials on AMR to the local context and involving trusted ambassadors to motivate stakeholders.

2) Recommendations targeting practice gaps:

Challenge: disease prevention is insufficient to reduce the need for antimicrobials. This may be tackled by:

1. Developing and implementing locally adapted vaccination, biosecurity and herd health programs for better disease prevention and control at the farm, sub-national and national levels.
2. Taking voluntary and mandatory measures to enhance disease prevention pursued by farmers. This may include animal health certification systems: e.g., that farms or products are certified, and products sold at a higher price based on good animal husbandry and prudent use of antimicrobials. Such branding may cause consumers to make informed choices and promote compliance with disease prevention practices.

Challenge: suitable and affordable diagnostics are inaccessible, resulting in inappropriate prescription and use of antimicrobials. This may be tackled by:

1. Establishing government-subsidized laboratory facilities and services, especially in LMICs.
2. Encouraging animal health professionals to collect and submit samples to laboratories through information campaigns.

Challenge: fragmented data on current antimicrobial use and resistance patterns. This may be tackled by:

1. Improving the infrastructure, laboratory, and epidemiology capacities in surveillance. Actions should include improved data collection, analysis, data sharing, and evaluation of the effectiveness of measures, especially in LMICs.
2. Making stepwise improvements in government-led and -financed surveillance systems, involving animal-specific pathogens in addition to indicator bacteria.

3) Recommendations targeting governance gaps:

Challenge: policies, regulations, and infrastructure are insufficient to enable legal enforcement. This may be tackled by:

1. Governments creating awareness and building trust among food producers regarding the need for more stringent regulations and policies.
2. Decision-makers taking a participatory approach to developing policies and regulations with a wide range of stakeholders for better acceptance, promotion, and applicability.
3. Establishing international trade agreements (soft laws) on higher production standards including prudent use of antimicrobials. Working with the World Trade Organization (WTO) and key national and international organizations to promote increased acceptance of and compliance with these standards.

Challenge: suboptimal coordination of donor funds and grants to tackle the complexity of AMR within and between sectors. This may be tackled by:

1. Creating synergies to improve coordination of funding for projects related to National Actions Plans (NAP) and national guidelines on AMR. Different projects can be interlinked with multisectoral coordination mechanisms to deliver a significant impact (e.g., through the Quadripartite, and the AMR Multipartner Trust Fund).
2. Performing cost-benefit analyses on effective measures to tackle AMR to guide coordination of donor funds, grants, and investments (e.g., done by the World Bank).

Tackling AMR is necessary if we are to protect human and animal health while increasing sustainability in the food and agricultural sectors. Without AMR containment, the United



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Nations Sustainable Development Goals are less likely to be accomplished, risking our ability to achieve the goals of ensuring food security and nutrition, ending poverty, ensuring good health and wellbeing as well as economic growth, globally.

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