

**How to implement policies and regulations to control antimicrobial resistance in animal husbandry?**

Yong Ho Park

Seoul National University, Korea

Antimicrobials have a key role to play in protecting animal health and welfare. Protecting animals against disease contributes to the production of high quality food from healthy animals whilst minimizing the impact on the environment. The concern that the use of antimicrobials in food animal production can increase the risk of selection of antimicrobial resistant bacteria has led to international expert meeting on combating antimicrobial resistance. A variety of recognized international, governmental, and professional organizations have worked to develop and implement various types of risk management activities. We briefly summarize below some important activities or recommendations for effective implementation of policies and regulations to combat antimicrobial resistance.

**Commitment for implementation of policies and regulations**

National governments must commit to a comprehensive plan to implement policies and recommended measures for containment of antimicrobial resistance. Strong leadership and political will are required to translate knowledge and recommendations into practice. Besides, civil society representatives should be involved in the implementation of the action plan and the monitoring activities.

**Strengthening the monitoring systems on antimicrobial usage and resistance**

Surveillance of antimicrobial usage and resistance provides important data for the identification of resistance problems and contributing factors for the development and spread of resistance at a national and local level. A paucity of surveillance data contributes to a poor understanding of the scale of the problem and hampers an effective response to it. Moreover, antimicrobial resistance trends should be consistently monitored over time and across geographical areas and should be shared at the regional and global levels. Many countries conduct veterinary monitoring programs

for food-borne pathogens, indicator bacteria, and animal pathogens from animals and animal products. However, harmonization and standardization are needed to compare situations at the national and international levels.

### **Regulatory decisions based on risk assessment**

The purpose of risk assessment is to supply the proper information to risk managers, policy makers, and other stakeholders. It is based on Codex and OIE frameworks of risk assessment with the incorporation of several adaptations and alternative approaches in response to important data gaps and the needs of risk manager. Several risk assessments have been conducted and some have contributed to regulatory policies in countries such as USA and Australia. However, the results of risk assessment can vary in different countries or regions in the world because of differences in risk tolerance and in the respective importance given to human health over animal health. With increasing demands for evidence-based and transparent decision-making on public health, there is a lot of work to be done in the area of risk analysis including development of further methodology and training of personnel.

### **Strict enforcement of guidelines on prudent use of antimicrobials**

The rational use of antimicrobials in real practice is essential for containing antimicrobial resistance. International organizations have emphasized the importance of prudent and rational use of antimicrobials in animals in order to minimize the possible impact of animal antimicrobial usage on public and animal health. A guiding principle with respect to antimicrobials use should be “as little as possible, as much as necessary” since we owe it to both present and future generations to use these agents with care and discrimination. Furthermore, the overuse and misuse of antimicrobials in animals for human consumption must be addressed by educating veterinarians and farmers and through legislative and regulatory measures. It is essential that all parties work together to ensure safe use and to minimize the development of resistance.

### **Reduction of antimicrobial use in animal husbandry**

To tackle antimicrobial resistance, decreasing the use of antimicrobials is essential by minimizing infections in food animals. This can be achieved by improving hygiene, biosecurity,

and health management on farms and preventing disease through the use of vaccine and other measures such as probiotics, prebiotics, or competitive exclusion products.

### **Communication and education**

More efforts should be exerted to raise public awareness of the importance of antimicrobials in treating bacterial infection and the public health challenges of antimicrobial resistance. It is also essential to educate people including farmers and veterinarians on the importance and benefits of the prudent use of antimicrobials and providing relevant information about resistance.

In conclusion, interventions to reduce antimicrobial resistance by risk management will be able to minimize antimicrobial resistant bacteria and ensure that healthy animals enter the food chain, while allowing responsible use of antimicrobials in animals. Furthermore, a “One health” approach to antimicrobial use and resistance is essential to minimize the antimicrobial resistance in humans and animals. To solve antimicrobial resistance problem, collaboration among human health, animal health, and environmental health communities is critical.

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