# Anti microbial resistance

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**Dr.Shorouq Abdel-Haliem Al-Fawarah**

**Pharmacy and Drug control Division**

**Ministry Of Agriculture**

**JORDAN**

# Overview

- Introduction
- Antimicrobial use
- Antibiotic in Jordan
- Growth promotor in Jordan
- Legislation in Jordan
- National plan to control AMR

# Appropriate use of antimicrobials

- Antimicrobial agents in animals are used for therapeutic, metaphylactic, prophylactic and growth promotion
- The appropriate use of antimicrobials is the cost effective use of antimicrobials which maximizes clinical therapeutic effect while minimizing both drug related toxicity and the development of antimicrobial resistance.
- Therapeutic failures due to drug resistant pathogens or super infections lead to an increased potential for the spread of these organisms throughout the community.
- Improving antimicrobial use must be a key action in efforts to contain resistance.

# What is antimicrobial resistance?

- Resistance to antimicrobials is the occurrence of strains of microorganisms that are able to multiply in the presence of drug concentrations higher than the concentrations received by therapeutic doses. Such resistance may associated with the entire species or through mutation or gene transfer.
- With the widespread use of antimicrobials, the prevalence of resistance to each new drug has increased. And this prevalence varies widely between and within countries and over the time.

# What is antimicrobial resistance?

- Animals play a role as a reservoir of resistance genes or resistant bacterial pathogens which may cause diseases in humans.
- Agricultural antimicrobial drug use is a major driver of antimicrobial resistance worldwide for four reasons: It is the largest use of antimicrobials worldwide; much of the use of antimicrobials in agriculture results in sub therapeutic exposures of bacteria; drugs of every important clinical class are utilized in agriculture; and human populations are exposed to antimicrobial resistant pathogens via consumption of animal products as well as through widespread release into the environment.
- The total consumption of antimicrobials is the critical factor in selecting resistance

# What is antimicrobial resistance?

- underuse through lack of access, inadequate dosing, poor adherence and sub standard antimicrobials may play as important role as overuse.
- however the inappropriate use of antimicrobial agents does not achieve the desired therapeutic outcomes and is associated with the emergence of resistance. For this reason, improving use is a priority if the emergence and spread of resistance is to be controlled.
- Other factors contributing to the epidemiology of antimicrobial resistance are the localization and size of the microbial population, and the age, immunity and contact intensity of the host. In livestock, dynamic herd related resistance patterns have been observed in different animal species.
- Supplementing animal feed with antimicrobial agents to enhance growth has been common practice for more than 30 years and is estimated to constitute more than half the total antimicrobial use worldwide.
- This lead to the appearance of multi resistant food borne pathogens

# Antibiotic use in Jordan

- Antibiotics are registered in Jordan as any other pharmaceutical preparations.
- Regulations in Jordan prohibit sold of antibiotics without registration
- Registration undergoes  with a strict requirements.
- Recent regulations prohibit the use of antibiotics as growth promotors
- Regulations state that antibiotics must be sold only with a medical prescription.

# National plan to avoid AMR

By the end of the year 2015 competent authority start putting a national plan to avoid AMR;

**<u>FIRSTLY</u>: It starts with Registration:**

- An effective registration scheme is established to Ensure that only antimicrobials meeting international standards of quality, safety and efficacy and don't have cross resistance with human health are authorized.
- The registration of some antibiotics which were used as Growth promotor has been stopped as Avilamycin.
- The registration of some antibiotics in which studies show a cross resistance with human health is cancelled as Lincomycin.
- The registration of some products used as antibiotics in premix is stopped as Bacitracin, Chlortetracycline.
- The new requests for registration of some products which used as antibiotics in premix are refused as Flavomycin.

# National plan to avoid AMR

**SECONDLY: RESTRICTION ON IMPORTATION:**

- Any products in a category belong to the previous slide is banned to be imported
- The quantities of the active raw materials imported by the local plants and which used for antibiotic manufacturing are detected.
- Collect and report data on antimicrobial distribution (including import/export).

**THIRDLY:**

- The ministry increased their inspection on pharmacies and veterinary stores and ask for the medical prescription of any antibiotic sold.
- Also they sequestrate the illegal products (products which are un registered).

# National plan to avoid AMR

**FOURTHLY:**

- In 2017 a tripartite committee from Oie , WHO and FAO focal points is formed to put a national action plan to combat against AMR and to address the problem.
- besides participants from the university, governmental laboratory, veterinary association and agriculture association engineers are involved.
- The committee put a framework of recommendations to reduce the overuse and misuse of antimicrobials in food animals for the protection of health
- Their actions taken on the basis of surveillance and analysis of data.
- Then use the data to inform policy decisions, update national formularies or lists of essential drugs and evaluate the cost effectiveness of interventions.

# Recommendation of national committee

- Educate all groups of prescribers and dispensers (including drug sellers) on the importance of appropriate antimicrobial use to avoid resistance.
- Promote educational programs on the accurate diagnosis and management of common infections
- Require obligatory prescriptions for all antimicrobials used to monitor volumes and patterns of use of antimicrobials for disease control in food animals and to detect resistant pathogens
- to develop measures to strengthen legislation to prevent the manufacture, sale and distribution of counterfeit antimicrobials and Create national systems to monitor antimicrobial usage in food animals.

# Recommendation of national committee

- Encourage cooperation between industry, government bodies and academic institutions in the search for new drugs.
- Encourage drug development programs which seek to optimize treatment regimens with regard to safety, efficacy and the risk of selecting resistant organisms.
- Seek innovative partnerships with the pharmaceutical industry to improve access to newer essential
- support the establishment of networks, with trained staff and adequate infrastructures, which can undertake epidemiologically valid surveillance of antimicrobial resistance and antimicrobial use to provide information for the optimal containment of resistance.

# Under process now

- Start formation of a governmental laboratory to detect residues.
- Begun Calculate the exact quantities of antibiotics used in Jordan by comparing (the quantities of antibiotics imported and quantities manufacturing ) compared to the number of poultry farms (mainly) and the total number of animal wealth in Jordan.
- Link professional registration requirements for prescribers and dispensers to requirements for training and continuing education , and link with website of ministry of agriculture.

# Thank you