

**ANTIMICROBIAL RESISTANCE AND ONE HEALTH: IMPLICATIONS FOR
AGRICULTURAL SYSTEMS, FOOD SAFETY AND THE ENVIRONMENT
Zaragoza (Spain), 18-22 March 2019**

PROGRAMME

- 0. Opening (1 hour)** (J. Sierra, J. Lubroth, J. Pinto Ferreira, M. Sprenger, B. González-Zorn)
- 1. Antimicrobial Resistance (AMR) as a global public health threat. Global initiatives and responses (1 hour)** (M. Sprenger)
- 2. AMR: the role of the agriculture sector (1 hour)** (J. Lubroth)
- 3. Responsible and prudent use of antimicrobial agents in animals and strategies to achieve implementation (1 hour)** (J. Pinto Ferreira)
- 4. AMR in the context of One Health (1 hour)** (B. González-Zorn)
 - 4.1. One Health concept and the need of multisectoral cooperation
 - 4.2. Antimicrobial Use (AMU) in agri-food systems
 - 4.3. Emergence and dissemination of AMR in bacterial communities
 - 4.4. The role of primary production, food and the environment on AMR dissemination
 - 4.5. Most pressing and emerging types of AMR (e.g. MRSA, ESBLs, Carbapenemase, *mcr* genes resistance to colistin)
 - 4.6. Pathways of transmission of AMR in the food chain
- 5. Regional initiatives and regulatory actions: the EU example (1 hour)** (E. Liébana)
- 6. National responses to AMR (6 hours)**
 - 6.1. The FAO Progressive Management Pathway (PMP) (1 h lecture + 1 h practical) (J. Lubroth, K. Mintiens)
 - 6.2. Regulatory areas relevant for AMR and regulatory responses to curb AMR (1 h) (C. Bullón)
 - 6.3. Development of a National Action Plan (NAP) (5.3 to 5.5: 2 h) (C. Rubio)
 - 6.4. Case study: the Spanish NAP (C. Rubio)
 - 6.5. Awareness building strategies and communication campaigns (C. Rubio)
 - 6.6. Open debate (1 h) (J. Lubroth, C. Rubio, C. Bullón, B. González-Zorn, J.Y. Madec)
- 7. Surveillance and monitoring of AMR/AMU for generation of evidence (8 hours)**
 - 7.1. Monitoring of AMR and AM residues in the food chain. Examples of existing programmes (2 h) (J.Y. Madec)
 - 7.2. Monitoring AM quality (6.2 to 6.5: 3 h) (J. Pinto Ferreira)
 - 7.3. How to collect AMU information: prescription and sales data, national surveys and associated challenges (J. Pinto Ferreira)
 - 7.4. Integration of surveillance systems and need for harmonized comparable data across sectors, countries and regions (J. Pinto Ferreira)
 - 7.5. Data gaps and challenges in collecting AMR and AMU surveillance information globally (J. Pinto Ferreira)
 - 7.6. Laboratory capacity building and assessment tools: the examples of FAO ATLASS and WHO GLASS (1 h lecture + 2 h practical) (B. Mouille)
- 8. Tackling AMR in practice (5 hours)**
 - 8.1. Preventive measures to reduce the need of antimicrobials and unintentional exposure to antimicrobials (e.g. biosecurity, vaccines, nutrition, hygiene) (1 h) (J.Y. Madec, J. Wagenaar)
 - 8.2. Optimization of AMU procedures according to types of animal and production systems, including application of leveraging technology (1 h) (J.Y. Madec, J. Wagenaar)
 - 8.3. Sustainable practices in agriculture and food production, and environmental protection (e.g. pesticide and waste management) (1 h) (J.Y. Madec, J. Wagenaar)
 - 8.4. Examples of countries in transition to more responsible production models (1 h) (J.Y. Madec, J. Wagenaar)

8.5. Open debate (J.Y. Madec, J. Wagenaar, C. Bullón, B. González-Zorn, D. Rodríguez-Lázaro)

9. Building evidence through research (4 hours) (B. González-Zorn, D. Rodríguez-Lázaro)

9.1. From phenotypes to genomics and metagenomics

9.2. Current research in AMR risk assessment: new source attribution models

9.3. Alternatives to antimicrobials: from phages to new vaccination strategies

9.4. The microbiome, gut health and animal nutrition

9.5. Research gaps: role of the environment, plant production and biocides, hot spots for AMR selection and transmission, etc.

9.6. Future perspectives: new machine learning techniques, new risk attribution model frameworks, new rapid diagnostic methods, etc.

9.7. International research initiatives on AMR: instruments, outcomes and future needs

10. Practical group work on AMR management based on case studies (5 hours)

10.1. Introduction to the practical (1 h) (J.Y. Madec)

10.2. Working session (2 h) (J.Y. Madec, J. Wagenaar, C. Bullón, B. González-Zorn, D. Rodríguez-Lázaro)

10.3. Presentation of results and discussion (2 h) (J.Y. Madec, J. Wagenaar, C. Bullón, B. González-Zorn, D. Rodríguez-Lázaro)