

CODEX ALIMENTARIUS COMMISSION



Food and Agriculture
Organization of the
United Nations



World Health
Organization

Viale delle Terme di Caracalla, 00153 Rome, Italy - Tel: (+39) 06 57051 - E-mail: codex@fao.org - www.codexalimentarius.org

Agenda Item 3

CX/AMR 18/6/3
October 2018

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

AD HOC CODEX INTERGOVERNMENTAL TASK FORCE ON ANTIMICROBIAL RESISTANCE

Sixth Session

Busan, Republic of Korea, 10-14 December 2018

MATTERS ARISING FROM FAO, WHO AND OIE INCLUDING
THE REPORT OF THE JOINT FAO/WHO EXPERT MEETING (IN COLLABORATION WITH OIE) ON
FOODBORNE ANTIMICROBIAL RESISTANCE

Introduction

1. This paper aims to provide an update on the Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), and World Organisation for Animal Health (OIE) as well as the FAO/WHO/OIE tripartite activities on the prevention and management of antimicrobial resistance (AMR) since the 5th session of the *Ad Hoc* Codex Intergovernmental Task Force on Antimicrobial Resistance (TFAMR05).

Part 1: FAO/WHO (in collaboration with OIE) Scientific Advice to Codex

2. In recognition of the growing problem of AMR, its increasing threat to human, animal and plant health, and the need for a One Health Approach to address this issue, the 39th Session of the Codex Alimentarius Commission (CAC39) agreed it was important for the food safety community to play its part and re-established the *Ad Hoc* Codex Intergovernmental Task Force on Antimicrobial Resistance (TFAMR)¹ with the objectives of revising the *Code of Practice to Minimize and Contain Antimicrobial Resistance* (CXC 61-2005)² and to developing new guidance on surveillance programmes relevant to foodborne AMR.
3. A key objective of the work is to ensure that the revised Code of Practice (COP) and new guidance address all areas in the food chain relevant to minimizing the risk to public health from the development and spread of foodborne AMR. While there is a need for new and up-to-date scientific advice on many aspects of foodborne AMR, the Task Force noted that the immediate priorities for scientific advice to inform the next TFAMR discussions were in the areas of crops, environment and biocides.
4. Responding to the request from CAC and TFAMR to provide scientific advice in the areas of crops, environment and biocides,³ FAO and the WHO convened, in collaboration with OIE, the first joint “FAO/WHO Expert Meeting on Foodborne Antimicrobial Resistance: Role of Environment, Crops and Biocides” in June 2018.
5. The meeting addressed the following priority areas: the prevalence of AMR bacteria and AMR genes (ARGs) present on fruit and vegetables; antimicrobial residues, AMR bacteria and ARGs in the immediate food production environment, namely in soils, irrigation water, and aquaculture; use of biocides in the food processing environment; evidence implicating the use of frequently approved antimicrobials and copper in horticulture production and the subsequent occurrence of AMR bacteria and ARGs in food; and crops, aquaculture products, and their production environments in integrated surveillance of AMR.
6. The summary report of this meeting was published online in the mid-July 2018⁴, and the full report will be available by the end of 2018. Several areas have been identified for which more guidance is required, e.g., water as a vector to transfer AMR, that will need to be addressed in subsequent meetings.

Tripartite Memorandum of Understanding to address human-animal-environment health risks

¹ [REP16/CAC](#)

² [CAC/RCP 61-2005](#)

³ [REP18/AMR](#)

⁴ The summary report is available at

<http://www.fao.org/food/food-safety-quality/scientific-advice/other-scientific-advice/en/>

Part 2: FAO/WHO/OIE tripartite activities on foodborne AMR

7. The tripartite organizations recently refreshed their commitment to working together to tackle One Health issues and to step up joint action to combat health threats associated with interactions between humans, animals and the environment. The Director-Generals of each organization signed a Memorandum of Understanding in May 2018, to strengthen their collaboration, with a strong focus on tackling AMR.⁵ The Tripartite met in September 2018 at FAO Headquarters to discuss key work areas for focus over the coming two years.

United Nations Interagency Coordination Group on AMR (IACG)

8. At its seventh meeting⁶ May 2018, the UN IACG⁷ on AMR assessed progress to date and agreed on a timetable for developing and finalizing its report and recommendations to the UN Secretary-General in 2019.
9. The IACG over the last year has taken forward work on critical issues through analysis and deliberation with particular focus on the following areas: public awareness, behavior change and communication; national action plans (NAPs); optimization of antimicrobial use (AMU); innovation, research, and development and improved access; surveillance and monitoring; and global governance post IACG and alignment with the Sustainable Development Goals (SDGs). This work has led to the development of discussion papers, which were posted for web-based public consultation until 31 August 2018.⁸
10. The comments received will be used to inform the development of the recommendations of IACG and its final report, and further enrich IACG discussions as it enters into the critical phase of its functions. During September, IACG Members will begin crafting draft recommendations as a group for discussion and agreement in late October 2018.
11. The IACG Secretariat welcomes the engagement of all Member States in the IACG process and deliverables to ensure harmonization of the work of IACG and TFAMR. All interested Member States are invited to contact iacg-secretariat@who.int for more information on possibilities for engagement with IACG.
12. Key upcoming IACG dates:
- 24-26 October 2018: IACG to discuss and finalize draft recommendations.
 - November – December 2018: Familiarization of draft recommendations with stakeholders.
 - 17-19 December 2018: 8th meeting of IACG to agree on final draft report and recommendations.
 - January – February 2019: Online public and stakeholder consultations of draft report and recommendations.
 - March 2019: 9th meeting of IACG meeting to agree and finalize report and recommendations.
 - May 2019: Submission of final report to the UN Secretary-General.

Global Development and Stewardship Framework to Combat Antimicrobial Resistance

13. WHO, together with FAO and OIE, and in consultation with UN Environment (UNEP) have developed a draft proposal for the global development a stewardship framework to combat AMR, as mandated by the UN High Level Declaration in 2016, and will present this to its member states at a second consultation of member states and partners in October 2018.
14. The framework proposal is a comprehensive approach to addressing some of the gaps of the Global Action Plan (GAP) and recommends additional steps through an innovative global framework that brings AMR governance and sustainable action to combat AMR to the next level. It builds on the ongoing initiatives that stem from the GAP and NAPs, fills gaps and aims to strengthen in particular research and development (R&D), access and stewardship and the environment across the human, animal and plant sectors to combat AMR through collective and sustainable action with an accountability, financing and legal framework

⁵ <http://www.who.int/zooses/Tripartite-partnership/en/>

⁶ Report available here:

http://www.who.int/antimicrobial-resistance/interagency-coordination-group/IACG-AMR_SeventhMtgReport.pdf

⁷ More information about IACG is available here:

<http://www.who.int/antimicrobial-resistance/interagency-coordination-group/en/>

⁸ <http://www.who.int/antimicrobial-resistance/interagency-coordination-group/public-consultation-discussion-papers/en/>

Tripartite Integrated Surveillance System on AMR/AMU (TISSA)

15. There is currently no coordinated system for surveillance of AMR and AMU across humans, animals, food, and plants at the global level.
16. FAO, OIE and WHO are working on the development of a global TISSA that could help monitor AMC and AMR, follow trends, develop new tools, and measure impacts of regulation over time at national, regional and global levels.
17. An initial step towards TISSA will be the creation of a tripartite portal for coordinated access to existing information from the different sectors being gathered by the three organizations. Such a portal would provide countries with an integrated visualization of comprehensive AMU and AMR data, and assist in the decision-making and implementation of a One Health Approach to tackle AMR.

Monitoring of the Global Action Plan on AMR

18. The tripartite organizations have co-developed a monitoring and evaluation (M&E) framework for the GAP on AMR. The framework aims to provide a manageable system that can generate useful data to assess the success of the GAP and inform operational and strategic decision making on AMR for the next five to ten years. It will also underpin the global development and stewardship framework that is currently under development. The framework was developed in consultation and collaboration with many national and international partners and experts.
19. All components of the M&E framework have been developed with a one-health perspective, to reflect the inter-sectoral nature of AMR. That includes identifying approaches and proposed indicators across human and animal health, and plant, food production and the environment.
20. Another component of this M&E framework is the Global Tripartite survey of country progress. The survey developed and administered jointly by the Tripartite, reflects country progress in the human, animal (terrestrial and aquatic), plant, food safety and environmental sectors. The survey is conducted annually and country responses to year one (2016-17) and year two (2017-18) are available on an open access database offering scope for in-country review with civil society and other stakeholders.
21. In July, the three organizations reviewed and analyzed the second round of responses from the tripartite self-assessment questionnaire for countries to assess their progress in terms of the development and implementation of NAPs.⁹ The results from the questionnaire are also available in an online public database.¹⁰ The self-assessment questionnaire will be one of the key data collection platforms to inform progress against the indicators to be used for monitoring and evaluation of implementation of the GAP on AMR; the questions are currently under revision to align with these indicators, and the third round of the questionnaire will be launched in October 2018.
22. Under the auspices of a tripartite project to apply a One Health Approach to address AMR, which is funded by the United Kingdom Fleming Fund¹¹, the three organizations are promoting and supporting strong collaboration at regional and country level. A number of focus countries have been identified to champion the One Health Approach. Some of the challenges being faced and lessons learned to date are being identified through case studies at regional and country level, and through regional workshops where countries share and learn from their experiences. Multisector engagement on all aspects of NAP development at country level are being promoted and supported where feasible.

⁹ <http://www.fao.org/3/ca0486en/CA0486EN.pdf>

¹⁰ Database available at

https://extranet.who.int/sree/Reports?op=vs&path=%2FWHO_HQ_Reports/G45/PROD/EXT/amrcsat_Menu

¹¹ <http://www.flemingfund.org/>

Part 3: Other related matters arising from FAO, WHO and OIE

23. FAO is dedicated to strengthening the global commitment to address the threat posed by AMR with a strong emphasis on enhancing action at a local level through regional and country activities. The adoption of the FAO Resolution on AMR, in support of the GAP on AMR, and the subsequent development of the FAO Action Plan on AMR¹² to support the food and agriculture sectors to address AMR is the basis for the enhanced programme of work on AMR by the Organization. As part of this, FAO, in collaboration with OIE and WHO, are implementing an intensive programme of tripartite activities in line with “The Tripartite Commitment: Providing multi-sectoral, collaborative leadership in addressing health challenges”¹³ (October 2017) and the tripartite Memorandum of Understanding (May 2018), reaffirming the organizations’ commitment to combat AMR at human-animal-ecosystems interface.
24. This paper provides an overview of FAOs activities under the four pillars of its action plan – awareness, evidence, governance and good practice. The objective of the work is to strengthen and support the engagement of the food and agriculture sectors in efforts to address AMR, from the development of multi-stakeholder One Health National Action Plans through to their subsequent implementation. FAO is currently directly working with the food and agriculture sector in countries in Africa, Asia, Latin America and Eastern Europe and Central Asia to address AMR.

Awareness raising and development of National Action Plans

25. Raising awareness and understanding among all stakeholders in the food and agriculture sector remains critical to a fully coordinated and effective One Health Approach to addressing the threat of AMR. It is essential to raise awareness among these stakeholders to increase the understanding of the relevance of AMR to them and the potential role that they can play in remedying the situation. In order to do so, a range of stakeholder events at the national and regional levels are being implemented, supported by the development of informational products tailored to the local situation. AMR is also being introduced into the agendas of meetings and events on related areas. A side event was held by FAO in January 2018 at the Prince Mahidol Award Conference in Bangkok, Thailand, on “A One Health Approach for Tackling Antimicrobial Resistance: Moving from Knowledge to Action”.
26. A library of informational products (videos, infographics, posters etc.) have been developed to support awareness raising on AMR and is available on the FAO webpage¹⁴ and YouTube¹⁶. This is being complimented by communication strategies on AMR at global and regional level to ensure that pertinent information is reaching the relevant stakeholders. For example, a region-wide communication and advocacy strategy for AMR in Asia has been developed. In Latin America Guidelines for the design of awareness and advocacy strategies for AMR¹⁷ have been developed that provide a conceptual and methodological framework for the design and implementation of advocacy strategies aimed at visibility, awareness and positioning of the risks of AMR and the need for its containment among decision-makers, policy-makers and civil society. A pioneering regional plan aimed at fostering interaction and synergy between the Ministries of Agriculture and the mass media has also been developed in the region.
27. Support is also being provided to countries to develop their national communication strategies. World Antibiotic Awareness week (November 2017) was marked with a global tripartite campaign¹⁸, with awareness materials made accessible to all via an online platform¹⁹; an ASEAN regional campaign was also held to highlight good practices in food and agriculture to reduce the need for use of antimicrobials²⁰.
28. A particular focus of in-country work is the development of NAPs on AMR, a starting point for which is the development of a national situation analysis. FAO, with input from WHO and OIE has developed short guidance to support inclusion of the relevant food and agriculture aspects in any situation analysis related to AMR, and is currently developing a self-assessment tool to help countries to determine where to concentrate their activity to strengthen their response to minimizing development and transmission of AMR in food and agriculture sectors.

¹² The FAO Action Plan and Resolution on AMR are available at <http://www.fao.org/3/a-i5996e.pdf>

¹³ The Tripartite Commitment: Providing multi-sectoral, collaborative leadership in addressing health challenges is available at: http://who.int/zoonoses/tripartite_oct2017.pdf?ua=1

¹⁴ The FAO webpage on AMR is available at <http://www.fao.org/antimicrobial-resistance/en/>

¹⁵ E-bulletins raising awareness on AMR (Spanish)

<http://www.fao.org/antimicrobial-resistance/projects/en-curso/project-4/es/>

¹⁶ Examples of FAO videos on AMR are available at [AMR YouTube playlist](#)

¹⁷ <http://www.fao.org/3/i9234es/i9234ES.pdf>

¹⁸ <http://apps.who.int/world-antibiotic-awareness-week/activities/en>

¹⁹ <https://trello.com/b/tBoXeVae/tripartite-amr-comms-toolkit-fao-oie-who>

²⁰ <http://www.fao.org/asiapacific/news/detail-events/en/c/1062293/>

29. Considering the limited data available on AMR and AMU in food and agriculture sectors in less developed regions, it is essential to create the necessary enabling environment to foster sustainable changes in the implementation of NAPs. In the Latin America and Caribbean region, FAO has developed a methodology based on risk analysis for intersectoral analysis of AMR on animal, fish and agricultural production. The methodology has been piloted in several Latin America countries and has identified critical gaps in food production sectors regarding AMR risks and mitigation strategies. The aim is to enable countries to prioritize higher risk areas and production sectors when implementing their NAPs, developing their national strategy and policy guidance.
30. FAO supports stakeholder engagement initiatives, policy development programmes, development of work plans, and strategies for monitoring and evaluation of the NAPs leading to the adoption of One Health NAPs by countries. FAO has supported a number of regional workshops bringing countries together to share experiences on NAP development, for example, in July 2018 the Southern Africa Development Community (SADC) member states participated in a workshop co-organized by SADC and the Tripartite to discuss a regional AMR Strategy to be collectively implemented by the 15 countries.

Evidence and surveillance

31. To support the food and agriculture sectors in understanding their capacities in relation to AMR susceptibility testing and surveillance, FAO has developed a tool for the assessment of AMR laboratory capacity and surveillance (ATLASS) in food and agriculture. This tool has been successfully applied in fourteen countries across Asia and Africa. The outcomes are used as the basis for national level discussions on the establishment of AMR surveillance programmes in the food and agriculture sector, with the objective of building on existing capacities to the extent possible to facilitate sustainability. Training for new ATLASS assessors was held in Singapore in May, to enhance assessment capacity within the region; the aim is that countries are enabled to self-assess their capacity going forwards. A second training for assessors is being planned in Russia in August 2018, and a further session in southern Africa in October 2018.
32. A number of country-level initiatives are underway in different regions to improve local knowledge of AMU in agriculture. For example, in Asia, information on AMU in the livestock production system commenced with the development of a framework to track the flow of antimicrobials to and within production systems, by mapping of the livestock sector, the food production sector and defining the value chains for antimicrobials produced locally and internationally. In some countries, this is also linked with efforts to explore the economic aspects of minimizing AMU in animal production. Approaches vary by country, but emphasis is focused on expansion and strengthening pre-existing mechanisms of on-farm data collection. A regional meeting of experts on the use of antimicrobials in aquaculture in Latin America convened the 8 main aquaculture producers in the region.
33. A regional approach to AMR surveillance in the food and agriculture sectors in south East Asia has been supported by FAO. Following the Consultative Meeting on the Regional AMR Surveillance in the Animal Health Sector of South-East Asia held last in June 2017, a regional technical advisory group on AMR was created to facilitate the design of a set of regional surveillance guidelines. Drafting workshops were held in August and September 2017 for the regional guidelines on surveillance of AMR in terrestrial and aquatic pathogens. In Latin America, a regional event on gaps in governance, surveillance and containment of AMR was held to identify priority gaps to mitigate AMR in each sector, and a preliminary analysis of the feasibility of the mitigation measures was made. Capacity development activities, including laboratory training, have been implemented in the Asian and Africa regions for interested countries in preparation for implementation of their monitoring and surveillance programmes. Two regional training programmes have been held in Kenya for countries in Southern and eastern Africa, to upskill national laboratory technicians on bacterial isolation and sensitivity testing protocols, with the aim that training is further cascaded subsequently at the national level. A regional training session was also held in Thailand on laboratory techniques for AMR testing in fishery and aquaculture products, November 2017.
34. FAO has identified 10 Reference Centers around the world to specifically support the implementation of its work with the food and agriculture sectors in member countries related to AMR. Work plans are currently being developed for each Reference Centre to enable them to become operational in the course of 2018.
35. Increasing knowledge about the significance of contamination of the environment and foods with low concentrations of antimicrobial residues has prompted renewed interest in antimicrobial residues. Residue monitoring may prove to provide an indirect measure of AMU. Regional training sessions were held in Thailand on testing for antimicrobial residues, November 2017, and in Vietnam on antimicrobial residue analysis in fishery and aquaculture products, December 2017.

Governance

36. To establish efficient and effective governance mechanisms, access to up-to-date national legislation relevant for AMU and AMR plays a key role. FAO is supporting legislative review processes and development or revision of existing legislation at country-level to ensure that the relevant legal instruments are in place to facilitate actions. Lessons learned from these reviews are being documented and will form the basis of a guidance document being developed in collaboration with OIE on the legislative aspects of addressing AMR in the food and agriculture sectors.
37. A regional workshop on the role of legislation in relation to AMR was hosted in Bangkok in March 2018, to share experiences and raise awareness among countries in the region on the importance of legislation as a tool for AMR prevention and containment. Regulators were engaged from countries across the ASEAN region, together with the Tripartite and ASEAN colleagues, on options that can impact on AMR within a number of regulatory areas. Two additional such regional events are being planned in Africa and Asia, moving towards a focus on how regionally harmonized approaches can facilitate more effective regulation in relation to AMR, for example in relation to veterinary medicinal products.
38. FAO hosts FAOLEX, the largest collection of agriculture relevant legislative instruments and is undertaking a process of identifying existing records in FAOLEX that are relevant for AMU/AMR, and tagging them appropriately for easy identification and retrieval. To date this encompasses legislation governing veterinary medicines, feed, and maximum residue limits (MRLs) for veterinary medicines. Records will also include, among others, selected instruments in the areas of food safety, animal health, animal production, fisheries/aquaculture, feed, waste/hazardous waste/hazardous substances, environmental protection and water quality. The work is also facilitating comparative legal analyses for a study on AMR legislation to support guidance in this area.

Good Practices.

39. Recognizing that progress on combating AMR will not be achieved without changing practices, this is a key focus for FAO activities on AMR. While globally driven, the need to adapt practices to the local context is viewed as critical for success. Changing practices begins with awareness and FAO have recently produced a series of videos looking at the situation in low and high-income countries to highlight the challenges, feasibility and approaches to changing practices to reduce AMU²¹. Following an open call for data submission, over 300 different guidelines were received relating to good practices in food and agriculture; these are currently undergoing a quality review process with the aim of populating a repository.
40. In Latin America, a regional workshop on promotion of good practices was held in collaboration with the Pan American Association of Veterinary Sciences (PANVET), with leading international experts to identify and prioritize the constraints and priorities for the adoption of good practices for AMR in the agri-food systems of the region.
41. At country level, this work begins with studies to review of existing knowledge, attitude, and practices (KAP). Such studies have already been undertaken or initiated in a number of countries in Asia, where an enhanced KAP+ framework has been developed, which also takes account of potential interventions. A series of harmonized KAP studies have also been initiated in a number of countries in Africa, which will be followed by locally led interventions to address selected practices. Interventions include training and capacity building on targeted areas such as biosecurity, husbandry and antimicrobial prescribing; Bangladesh has initiated a collaboration of prescribers (the Bangladesh AMR Alliance) and FAO has supported BARA to develop species-specific, locally relevant, prescribing guidance for humans and animals available via a single smartphone app. These country level approaches are also supported by more centralized initiatives to review existing practices, examples of which follow below.
42. In many regions, access to veterinary care and oversight is not always readily available. Regionally appropriate AMU guidelines have been developed for common disease of poultry (Bangladesh) and for swine (Eastern Europe).

²¹ An FAO video on food practices to address AMR is available at: https://youtu.be/U0TQE_XZRPo

Animal Feeding Practices

43. AMR has been on the agenda of the annual joint meeting of FAO and the International Feed Industry Federation (IFIF) for the past three years. As a result of the progressive engagement with the animal feed sector to address AMR, this issue is now a regular discussion item during the annual International Feed Regulators Meetings²². FAO has produced a video to highlight how the feed sector can contribute to decrease the use of antimicrobials “Voices from the feed sector on containing antimicrobials resistance²³”.
44. In light of the positive role, changes in animal feed and nutrition can play in reducing AMU and the need for practical guidance for countries, FAO is developing “Animal nutrition strategies to reduce the use of antibiotics in animal production (swine, poultry and ruminants)”. This publication, together with case studies, will be disseminated through a series of workshops and technical documents in collaboration with the feed industry, to support changing animal feeding practices.
45. FAO is engaged with a variety of stakeholders from the public and private sector involved in animal and feed production to contribute decreasing AMR. FAO works on the provision of scientific advice and capacity development to secure the safety of feed and therefore decrease the need for antimicrobial treatments of animal diseases. A specific section on AMR is being organized within the sixth Global Feed and Food Congress that FAO contributes to organize with IFIF (11-13 March 2019, Bangkok, Thailand).
46. Animal nutrition and feeding can play a significant role in reducing the need for antimicrobials in animal production; for this reason, FAO is producing publication providing specific information and practical guidance on “Animal nutrition strategies and options to reduce the use of antibiotics in animal production (swine, poultry and ruminants)”. The information will be disseminated through a series of workshops and technical meetings organized in collaboration with the feed industry and other stakeholders, to support changing animal feeding practices and reduce the use of antimicrobials. A side event on this topic is planned during next meeting of TFAMR.
47. FAO is preparing a publication on “Eubiotics in animal nutrition” that provides additional information on feed ingredients and additives that can be used to ensure adequate growth of the animal and contribute to avoid the use of antibiotics as growth promoters. In addition, FAO is preparing a paper on “Animal Welfare Strategies to Reduce AMR.”
48. The FAO-facilitated Multi-Stakeholder Partnership for Feed Safety and the FAO Legal Department are gathering information on the production, distribution and use of medicated feed and antibiotics used for growth promotion, as well as on the legislation regulating them. The information gathered will be used to prepare a publication and guidance material on the role of feed legislation to reduce the overuse and misuse of antimicrobials in animal production and on how to regulate medicated feed production and use.
49. FAO is dissemination information on AMR through a number of sector-specific channels, for instance the FAO Livestock Technical Network Newsletter.

Fisheries and aquaculture Practices

50. FAO is in the process of finalizing the following documents regarding AMU and AMR in the aquaculture sector for publication:
 - FAO Code of Conduct for Responsible Fisheries Technical Guidelines on the Prudent and Responsible Use of Veterinary Medicines in Aquaculture; this will provide information on the global challenges, the risk and benefits of AMU, salient issues concerning their use, and a number of recommendations to governments and to the private sector, including guidance for small-scale aquafarmers and to aquatic animal health professionals.
 - Responsible Management of Bacterial Diseases in Aquaculture.
 - Fisheries and Aquaculture Technical Paper containing thematic papers presented during three regional AMR held workshops in 2017, including on the development of AMR NAPs in China, Malaysia, the Philippines, Singapore and the USA.²⁴
 - Best practice guidance to minimize AMR in carp, shrimp and tilapia production.

²² A video description of the International Feed Regulators Meeting is available at <https://www.youtube.com/watch?v=QfcLEHIWZA>

²³ Voices from the feed sector on containing antimicrobials resistance is available at: <https://www.youtube.com/watch?v=8HJiGzSTc>

²⁴ <http://www.fao.org/fishery/nems/40929/en>
<http://www.fao.org/fishery/nems/40956/en>
<http://www.fao.org/fishery/nems/41001/en>

51. The 33rd Session of the FAO Committee on Fisheries (July 2018) highlighted the important issues of biosecurity, aquatic animal health and AMR and the need for countries to build capacities on these issues. A regional AMR in aquaculture consultation is being planned in September 2018, and a risk assessment of AMR in aquaculture will be conducted through an expert working group meeting.

Crop production

52. Given that some antimicrobials used in veterinary and human medicine are also used in horticulture production, FAO convened a meeting in October 2017 to begin gathering evidence of AMR linked to AMU in horticulture.²⁵ A review of the literature was undertaken in advance and is now been finalized based on inputs from the expert meeting. The meeting also considered data from some 30 countries provided in response to a call for data on AMU in plant production. Despite these efforts, a noticeable paucity of data in the area of AMR and horticulture was noted. This issue will be further addressed in ongoing work on AMR. Nevertheless, the importance of good practices to minimize AMU and ensure appropriate use when needed were highlighted.
53. FAO is working on the development of tools and instruments to support regulation and use of antimicrobial chemicals (e.g. pesticides) in the agriculture sector and support implementation of the international Code of Conduct on Pesticide Management.²⁶ FAO also promotes integrated pesticide management (IPM) as the preferred approach to crop production and has regional programmes ongoing in Asia, the Near East and Africa. This approach aims to minimize pesticide use including use of antimicrobials in crop production and more information on IPM and its role in pesticide risk reduction is available online.²⁷

Food processing and biocide use

54. In light of the importance of biocides (disinfectants, sanitizers) in achieving and maintaining microbiological food safety and in response to requests for information on biocide use, FAO convened a technical meeting on AMR and biocides in food production and processing in October 2017²⁰ to review the available information on this issue and discuss follow-up actions. Noting the limited data on the issue and the important role of biocides in food safety it was agreed that there was a need for greater awareness on good practices in relation to sanitation and disinfection to ensure this valuable resource are used optimally and effectively. Key aspects of such guidance was developed in the course of the meeting and this will be further developed in the coming months.

Food production and agriculture environment

55. FAO is collecting and synthesizing knowledge on the role of agriculture in contaminating the environment with antimicrobial residues and AMR bacteria as well as assessing the threats that AMR bacteria and residues in the environment pose for food contamination and safety. A meeting about soil and water contamination with AMR and AM residues was held in October/November 2017 at FAO Headquarters in Rome²⁰. Experts from North and South America, Europe, Asia, and Africa identified current gaps in knowledge critical for the control of environmental AMR and proposed future studies. Although recognized as an important source of environmental loading with AMR bacteria, the attributable contribution of agriculture to the problem, compared to pharmaceutical, hospital and municipal wastewater treatment and sludge, remains unknown. Nevertheless, environmental protection mitigation strategies that can be implemented immediately, even before additional data becomes available, were proposed.
56. A systematic review of AMR in water and the environment has been conducted to assess current scientific, peer reviewed, publications on AMR in water in LAC; while also identifying the gaps in AMR information in the region. This review focused on eight key themes including; livestock and aquatic production systems as sources of antibiotic resistance in environmental water; negative or unexpected effects of AMR and antibiotics on terrestrial and aquatic wildlife living organisms; degradation of AMR in the environment; impact of the use of antimicrobials in agricultural production; transmission of AMR genes from both humans and animals through water and detection of microorganisms harboring resistant genes; crossed AMR between antibiotics and heavy metals; emerging pests and diseases with potential impact on the production of AMR; and detection of microorganisms with phenotypic evaluation of AMR in water. The knowledge resulting from this review will provide information to focus research efforts and funding in priority areas that require further research in the Latin American and Caribbean (LAC) region.

²⁵ Reports from expert meetings on AMR and the environment, biocides and food of plant origin are available here: <http://www.fao.org/antimicrobial-resistance/news-and-events/news/news-details/en/c/1144999/>

²⁶ The tools and guidelines available can be found at: <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/en/>

²⁷ More information on IPM available at: <http://www.fao.org/agriculture/crops/core-themes/theme/pests/ipm/en/>

57. In May 2018, FAO hosted the Global Symposium on Soil Pollution (GSOP18). The overall theme of the symposium was soil pollution. AMR was a cross-cutting sub-theme presented as an emerging soil contaminant with possible impacts on food production and safety, as well as on soil biodiversity and overall human well-being.
58. FAO would like to express its sincere appreciation to those countries supporting the organization to implement its Action Plan on AMR, namely the United Kingdom, the United States of America, the Russian Federation, France and Sweden.

WORLD HEALTH ORGANIZATION**Integrated Surveillance on Antimicrobial Resistance in Foodborne Bacteria and the Global AMR Surveillance System (GLASS)**

59. WHO established the WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance (WHO AGISAR) in 2008. AGISAR include representatives from FAO and OIE and supports the efforts of WHO and its Member States to minimize the public health impact of AMR associated with the use of antimicrobials in food-producing animals through development of guidance documents/protocols, training workshops and country pilot projects.
60. In addition to AGISAR projects being currently implemented to strengthen the integrated surveillance of AMR in 15 countries, WHO AGISAR is developing a global protocol on surveillance of extended spectrum beta-lactamase (ESBL) producing *Escherichia coli* using a One Health Approach ("Tricycle ESBL *E. coli* surveillance project"). Tricycle ESBL *E. coli* surveillance project is intended to monitor the prevalence of one single AMR indicator, ESBL *E. coli* in humans, the food chain and the environment. Six countries have been trained to pilot the protocol during a period of one year starting from April 2018, including Ghana, Madagascar, Senegal, Pakistan, Indonesia and Malaysia. The Tricycle ESBL *E. coli* surveillance project also includes the protocol development for measuring certain antimicrobial residues in sewage and also would be link with the consumption and use of antimicrobial data in the human and animal sector that WHO and OIE are collecting, respectively.
61. Recognizing the need to foster the establishment of national AMR surveillance systems, WHO has developed the Global Antimicrobial Resistance Surveillance System (GLASS). GLASS focuses on AMR and antimicrobial consumption (AMC) surveillance that is relevant for human health and will foster links to AMR and AMC surveillance conducted in other sectors as relevant to human health. The early implementation phase of WHO GLASS focuses on the assessment and reporting of resistance of selected priority human bacterial pathogens to selected priority antimicrobials. It is planned that WHO GLASS will include data on AMC in humans and data from the integrated surveillance across the human-animal ecosystems interface (a scaled Tricycle project).
62. Currently, 64 countries are enrolled in WHO GLASS and seven others are going through the enrolment procedures. The first GLASS report has been published in January 2018 with information about the development process and data received from participating countries. It is planned that the WHO GLASS will expand a scope of data in future.
63. In 2016 WHO developed a methodology for monitoring national AMC. Since then, WHO supported the implementation of a national monitoring system in 51 countries with the majority of them being low and middle-income countries (LMICs) through regional or national workshops. Fifty-nine countries have submitted AMC data to WHO. These data will be published in 2018. WHO will continue to conduct trainings on the WHO methodology and support countries in implementing national surveillance system to monitor AMC.
64. Standardized methodologies to survey AMU in hospitals and in community settings will complement the surveillance of AMC. WHO has been giving priority to methodologies, as well as web tools for data collection tailored to hospital settings, but in a second round, will also develop methodologies for community settings. WHO will coordinate regional trainings on the methodologies and facilitate data collection following the trainings.
65. WHO has recently initiated work on antimicrobial stewardship to improve antimicrobial prescribing and use starting with guidance and support for the hospital setting followed by the community with a focus on LMICs. In June 2018, WHO headquarters convened a meeting on a draft toolkit for antimicrobial stewardship programmes in hospitals in LMICs, which will be rolled out globally in 2019. The Essential Medicines List and categorization of antimicrobials into Access, Watch and Reserve will be one of the tools for stewardship activities.
66. WHO has published the priority pathogen list (PPL) and the review of the R&D pipeline for antibiotics. WHO has identify a PPL for R&D with the highest priority to be given to Enterobacteriaceae, *Acinetobacter* and *Pseudomonas*. WHO has undertaken the 2018 update of the R&D pipeline and will continue to review how the pipeline responds to the WHO priority pathogens list on an annual basis and develop target product profiles (TPPs) to fill the gaps identified. WHO also continues to support the Global Antibiotic Research and Development Partnership (GARDP). WHO is investigating in the field of rapid diagnostic tests for AMR.

Use of medically important antimicrobials in the food chain

WHO list of Critically Important Antimicrobials for Human Medicine (WHO CIA List)

67. The development of the WHO CIA List was initiated in 2005, following the recommendation of a 2004 expert workshop on “Non-Human Antimicrobial Usage and Antimicrobial Resistance: Management Options”, jointly convened by FAO, OIE and WHO.
68. The WHO CIA List provides a ranking of Medically Important Antimicrobials to help prioritize risk management options regarding their use in non-human settings.
69. The list was periodically updated; the most important change in this fifth revision in 2016 was the new classification of Polymyxins as “highest priority critically important antimicrobials” because of the identification of plasmid-mediated colistin resistance and potential transmission through the food chain.
70. The current list and the process/criteria used to establish the list were published in April 2017 and are available online along with its advocacy brochure. A new revision and update will be done at the eighth meeting of WHO AGISAR scheduled on 24-26 November 2018 in Utrecht, the Netherlands.

Next steps

71. The revision of the WHO CIA List and recommendations on the use of medically important antimicrobials with a human health focus will be followed by the revision of the OIE list of Antimicrobial agents of Veterinary importance and recommendation on all antimicrobials including veterinary drugs not used in human medicine with animal health focus.
72. The outcome of these two first steps will inform joint tripartite FAO/OIE/WHO recommendations on use of all antimicrobial agents, including antimicrobials only used in veterinary medicine, in food-producing animals, including aquaculture.

WHO work on AMR in the environment with links to food production

73. Some years ago, WHO revised its Guidelines for the Safe Use of Wastewater, Excreta and Greywater in Agriculture and Aquaculture (third edition) with associated documents. None has a specific focus on AMR, however they are also valid for decreasing the risk for transmission of viable resistant microbes via food.
74. In 2014, a briefing note on the links between AMR and water, sanitation and hygiene (WASH) was developed. A policy options document is under way, in which the links will be further elaborated, and policy options suggested. To a large extent, the policy options will focus on the hazard of the development and spread of AMR within and via the environment, with a special focus on water.
75. Other environment focused projects are planned, subject to funding, such as:
 - a. For the Tricycle project environment residues part, carry out the process of expert agreement on what antibiotics to measure and by what analysis methodology.
 - b. Define wastewater target values for specified antibiotics meant for pharmaceutical industry, and based on best available technology.
 - c. Assess the proportion of AMR disease that can be attributed to inadequate access to WASH.

Support to National Action Plans

76. To date, 100 countries have multisectoral plans and further 51 are being developed. WHO, in conjunction with FAO and OIE, have developed guidance on NAPs, situation analysis and other relevant issues, such as multisectoral governance. Workshops have been held at regional and country levels to support the process.
77. 128 countries have multisectoral coordination mechanisms, but only 53 claim that they are functional with clear terms of reference. Case studies and guidance on multisectoral coordination, and on integrating AMR action within existing plans and budgets are being developed
78. A community of practice has been developed with 523 members in 99 countries. This provides relevant resources on AMR from the Tripartite and other stakeholders, disseminates updates and news, and provides a platform for discussion on critical issues.

WORLD ORGANISATION FOR ANIMAL HEALTH (OIE)

79. The "OIE Annual report on antimicrobial agents intended for use in animals – Better understanding of the Global Situation" was published in December 2017. Information regarding the barriers that impede OIE Member Countries to provide quantities of antimicrobials and the methodology to estimate the animal biomass using data provided for 2014 were described in this report. The third phase of data collection ended in May 2018. The fourth round is under preparation and will be launched in September 2018 via the issuing of the questionnaire to the 182 OIE Member and non-Member Countries.
80. At the 86th General Session of the OIE, Member Countries adopted definitions for veterinary medical and non-veterinary medical use, as well as definition of growth promotion. The revision of the OIE List of Antimicrobial Agents of Veterinary Importance was also endorsed, including new recommendations regarding phasing out use for growth promotion and additional recommendation on the use of colistin.
81. The OIE *ad hoc* Group on AMR met in July 2018 at OIE Headquarters. At this meeting, the Group updated the OIE List of Antimicrobial Agents of Veterinary Importance, with the intent of proposing updates taking into consideration the 2016 WHO Critically Important Antimicrobials for Human Medicine, and improving coherence between the WHO and OIE Lists with respect to terminology used for antimicrobial classification.
82. OIE is contributing, under the coordination of FAO, to the development of a manual, planned to be entitled "Manual on prudent and effective use of antimicrobials in poultry and swine – towards better productivity and less antibiotics", whose main audience will be poultry and swine producers in south east Europe.
83. OIE has produced a series of communication and awareness material for the implementation of national communication campaigns to be implemented during World Antibiotic Awareness week.²⁸
84. The second OIE Global Conference on Antimicrobial Resistance and the Prudent Use of Antimicrobials in Animals - Putting Standards into Practice will happen from 29-31 October 2018, in Marrakesh, Morocco²⁹. The meeting will include Political Panel by Ministers across the OIE Regions addressing "Animal Health Sector Participation in AMR National Action Plans" and an Industry Panel addressing "Driving Private Sector Engagement in the AMR Global Response". The Codex Alimentarius will be invited to give an update of its activities and develop further recommendations
85. OIE convened, in May 2018, an *ad hoc* Group to prioritize diseases for which the use of improved and new vaccines could reduce AMU cattle, sheep, and goats. This meeting completes the work started in 2015, which performed this same assessment for diseases of pigs, poultry and fish. The outcomes of this Group will contribute guiding research on new and improved vaccines to reduce AMU in animals.
86. OIE participated in several meetings aiming at identifying innovations to reduce the use of antimicrobials in food producing animals and to foster research and development of alternatives to antibiotics including prevention
87. OIE was represented by its highest hierarchy representatives at the IACG meeting in May 2018, and contributed to the preparation of the IACG different technical papers of which public consultation is now on going.
88. OIE hosted the 24th FAO/OIE/WHO Tripartite Annual Executive Coordination meeting (February 2018).
89. Collaborative work with the Tripartite continues on delivering an M&E framework for the Global Action Plan. Work continues on finalizing the M&E Framework, with the OIE leading on the development in collaboration with the FAO on a core set of indicators and methodology notes for the Animal Health Sector. The OIE has also drafted an outline costed options appraisal for the delivery of the Tripartite M&E function under the GAP.

²⁸ Available at <http://www.oie.int/index.php?id=2413&L=3>

²⁹ <http://www.oie.int/amr2018/en/>