CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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Agenda item 4 **CX/RVDF 26/28/4**

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON RESIDUES OF VETERINARY DRUGS IN FOODS

Twenty-eighth Session
23-27 March 2026
Minneapolis, Minnesota, Nebraska, United States of America

MATTERS OF INTEREST ARISING FROM THE JOINT FAO/IAEA CENTRE

(Prepared by the Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture[1])

INTRODUCTION

1. The International Atomic Energy Agency (IAEA) and Food and Agriculture Organization of the United Nations (FAO), through the Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture (Joint FAO/IAEA Centre), support and implement activities relevant to the Codex Committee on Veterinary Drug Residues in Food (CCRVDF) and related committees. The Joint FAO/IAEA Centre renders services to Member Countries of both organizations through technical cooperation projects (TCPs), coordinated research projects (CRPs) and now the Atoms4Food Initiative[2] as well.

2. The Joint FAO/IAEA Centre has continued cooperating with several Member Countries in controlling pharmacologically active veterinary substances and related substances. The following selected activities were implemented since the 27th session of the CCRVDF(CCRVDF27, 2024); others of future benefit are also included:

COORDINATED RESEARCH ACTIVITIES

3. Two coordinated research projects (CRPs) were implemented, and a new one was recently announced. These include a CRP on 'Depletion of Veterinary Pharmaceuticals and Radiometric Analysis of their Residues in Animal Matrices' that concludes in 2026 and the newly launched follow-up project 'Radiolabelled Food Animal Depletion Research for Food Safety Standards-Setting; Associated Radioisotope Production and Radiosynthesis', now open for proposals. The 3rd CRP is on 'Nuclear techniques to support risk assessment of biotoxins and pathogen detection in food and related matrices with a perspective on Antimicrobial Resistance (AMR).

4. 18 research institutions in Bangladesh, Brazil, Burkina Faso, Canada, Chile, Iran (Islamic Republic of), Morocco (Kingdom of), North Macedonia, Pakistan, the People's Republic of China, the Republic of Korea, Sudan, Tunisia, Uganda, the United States of America and Uruguay continued to conduct research on the 'Depletion of Veterinary Pharmaceuticals and Radiometric Analysis of their Residues in Animal Matrices'. Excerpts of work done under this CRP is presented in paragraphs 5-10 below.

5. **Investigating the depletion of tritium-labelled amitraz in sheep:** Research was conducted in North Macedonia on the depletion of amitraz in sheep after administration of the tritium-labelled [^{3}H] drug. A liquid scintillation counting method was used to measure the drug residues in blood, milk, faeces, fat, kidney, liver, muscle, and urine. [^{3}H] amitraz was distributed rapidly peaking in blood and excreta in a few hours, then dropping in edible tissues to trace or undetectable levels 28 days post-administration. Fat tissue retained the residues the longest, while levels in milk and muscle remained low throughout the study. To support the depletion study, a liquid chromatography-quadrupole time-of-flight mass spectrometric method was successfully developed and validated for the determination of amitraz and its major metabolites N-2,4-Dimethylphenyl-N'-methylformamidine (DMPF), N-2,4-Dimethylphenylformamide (DMF) and 2,4-dimethylanilin (DMA).

6. **Ongoing research on the depletion of amoxicillin and ampicillin in broiler chicken using tritium labelled drugs:** Researchers in Chile initiated work to evaluate the depletion of radiolabelled 3H-amoxicillin in broiler chicken and to determine the distribution of the radioactivity in edible and non-edible matrices. Additional work involves 3H-ampicillin in broiler chicken. The matrices of interest include kidney, liver, muscle, skin and associated fat, as well as feathers. This work is ongoing.

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1 Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture | IAEA

2 IAEA and FAO Launch Flagship 'Atoms4Food' Initiative to Expand Use of Nuclear Techniques for Global Food Security | IAEA

7. **Amoxicillin and doxycycline depletion in Bangladeshi Sonali chicken:** Two independent studies were conducted to evaluate the disposition and residue depletion of tritium-labelled doxycycline and tritium-labelled amoxicillin in Sonali chicken following oral gavage. Samples including skin-fat, kidney, liver, gizzard, muscle, heart, brain, bone marrow, offal, and excreta were collected after days 1, 2, 3, 5, 7, 9, 12 and 15 days post-treatment and total radioactive residue determined. These studies demonstrated that radioactivity was detectable in all examined tissues up to 15 days post-dose, indicating prolonged retention of doxycycline and amoxicillin residues in the bodies of the chickens.

8. **Amoxicillin-depletion study in Pakistan:** A study was conducted in Pakistan on distribution and depletion of 3H-labeled Amoxicillin in poultry. Following a single dose, various matrices including blood, gizzard, heart, kidney, liver, lungs, muscle, lungs, gizzard and skin with fat, as well as droppings were collected and analyzed on a period covering 1, 2, 3, 4, 5, 12, 24, 48, 72, 96, 120, 144 and 168 hrs.

9. **Radiolabelled sulfadiazine study in trout**: Sulfadiazine labelled with radioactive zinc (Zinc-65) was orally administered in rainbow trout fish in spring, summer and autumn. Matrices including fish fillets (muscle), skin and blood among others were sampled over specific time intervals and biodistribution of residues investigated using high purity germanium detectors. The samples were collected at time intervals ranging from 1 hour to 14 days post-administration. The residues were also visualized using positron emission tomography scans.

10. **Depletion of enrofloxacin (and ciprofloxacin) in fish:** A study was undertaken to investigate the depletion of enrofloxacin in rainbow trout fish. The drug used was labelled with radioactive zinc (Zn-65) and residues determined in various tissues/matrices including branchial tissue, fillet (muscle), heart, intestine, kidney, liver, pyloric sac, serum spleen and stomach. The study also included investigating presence of ciprofloxacin, the metabolite. Positron emission tomography was also used to visualize the distribution of the residues at different intervals from 30 minutes to 35 days.

11. **A new five-year CRP on 'Radiolabelled Food Animal Depletion Research for Food Safety Standards-Setting; Associated Radioisotope Production and Radiosynthesis:** In response to continued demands for data needed to establish maximum residue levels (MRLs), the Joint FAO/IAEA Centre has launched a new CRP[3,4] now open for expression of interests and submission of proposals. The objective is to support food safety standard-setting in Member States through the use of innovative radiolabelled studies followed by radiometric analysis of relevant food animal matrices. It will involve priority drugs and pesticides for animal production labelled with suitable radioisotopes such as but not limited to C-14, H-3, I-125, Na-22, N-15, P-32, S-35 and Zn-65.

12. Aligned with the Atoms4Food initiative, the Joint FAO/IAEA Centre is implementing two Peaceful Uses Initiative projects, titled '*Integrated Strategies for Managing Antimicrobial Resistance in Aquaculture: A Cross- Disciplinary Approach to Enhancing Aquatic Animal Health, Food Security, Food Safety, and Environmental Sustainability*', one focused on the Western and Central African aquaculture and one on the Indo-Pacific aquaculture. Both projects include research and development as well as capacity building activities to support Member States in using nuclear and related techniques to strengthen their analytical and monitoring capabilities regarding the determination of AMR-related antimicrobial residues in aquaculture products, thus safeguarding public health and addressing food loss and obstacles to trade. Within these projects, rapid methods for screening beta-lactam, chloramphenicol, and tetracycline residues are being developed in animal tissue (fish, shrimp, beef, chicken, pork) employing a radiometric technique that combines the use of tritium or C-14 radiolabeled tracers with liquid scintillation counting, along with confirmatory LC-MS/MS methods for determining antimicrobial residues in aquaculture fish.

CAPACITY BUILDING AND MEETINGS

13. **Regional training course on good laboratory practices (GLP) for animal disposition studies — Large terrestrial food animals:** This training was successfully held in Rabat, Morocco from 31 March to 4 April 2025 in cooperation with the Office National de Sécurité Sanitaire des Produits Alimentaires. It was attended by 32 participants from Benin, Botswana, Burkina Faso, Burundi, Congo, Djibouti, Egypt, Eswatini, Ethiopia, Kenya, Madagascar, Malawi, Mauritania, Morocco, Namibia, Nigeria, Rwanda, Senegal, Togo, Tunisia, Uganda and Zimbabwe. The scope included: an understanding of what GLP in food animal depletion/pharmacokinetic studies is; design, conduct and reporting of animal and related agrochemical studies; interpretation of data from depletion and related agrochemical studies using GLP and/or non GLP conditions; dossier-preparation and reporting; focus of a GLP (organization process and conditions for studies). Other aspects were GLP responsibilities and who fulfils GLP roles; qualified staff working in appropriate facilities with the correct equipment and materials; tests systems, apparatus and reagents; Physical/chemical test systems used to conduct animal depletion studies. The participants were also trained on the nature of test facilities and responsibilities along with associated safety conditions as well as required test items, reference items and sample/specimens, how they are handled and disposed of following appropriate management.

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3 https://www.iaea.org/projects/crp/d52047

4 https://www.iaea.org/newscenter/news/new-iaea-fao-research-project-on-radiolabelled-studies-for-food-safety

14. Guidelines and requirements for depletion studies, especially those of the Organization for Economic Co-operation and Development (OECD) associated guidance papers and areas of focus for regulators globally were also presented. Training was also provided on the interpretation of data from depletion studies; interpretation of data from depletion and related agrochemical studies; as well as reporting of such findings were also covered. A related training on 'Regional training course on GLP for animal disposition studies – small terrestrial food animals and aquatic food animals (fish) and on preparation of dossiers required in setting of MRL by national, regional/international risk managers in anticipated between 12-17 October 2026 in Cameroon.

15. **African Food Safety Workshop 2024/Third Africa Food Safety technical meeting, 7th-11th October 2024 in Marrakech, Morocco; Followup event in Cote D'Ivore, June-July 2026:** From 7th to 11th October 2024, the Joint FAO/IAEA Centre co-organized with Office National de Sécurité Sanitaire des produits Alimentaires, Morocco, a food safety technical meeting (also referred to as African Food Safety Workshop 2024) under the framework of the African Food Safety Network. 155 participants (mostly in-person) from 32 African countries as well as the United States Department of Agriculture, Foreign Agricultural Service; US Food and Drug Administration; the African Union; and the FAO country representative and representatives of the World Food Programme.

16. The meeting consisted of 12 sessions covering several themes such as: veterinary drug residue testing and monitoring; as well as associated standards; food safety awareness; Atoms4Food Initiative, systems and partnerships; Partnership development, Resource Mobilization for Food safety and control system sustainability; standards in Africa, accreditation, African Continental Free Trade Area. Others were risk analysis and networking; proficiency and sustainable laboratory excellence; research and capacity building opportunities at the IAEA and other institutions/development Partners etc.

17. The event included several individual oral presentations and panel discussions as well as 28 poster presentations and exhibitions by the three instrument vendors. Scientists were challenged to publish their food safety work in peer review journals; share them with policy makers advising on food safety matters of national and regional importance; and endeavor to participate in Codex meetings. A call was also made by the participants on developing and strengthening toxicological risk assessment in Africa. This would enhance risk analysis, standards-setting and consumer protection.

18. The follow-up event is anticipated in Abidjan, Cote D'Ivoire from 29 June to 3 July 2026. A related event is anticipated for the Asia Pacific region in October 2026.

19. **Training Workshop on Nuclear and Complementary Analytical Methods to Detect and Control Antimicrobial Residues and Antimicrobial Resistance in Aquaculture**: The Joint FAO/IAEA Centre is organizing this virtual training course on 23-27 February 2026 under the Atoms4Food initiative '*Integrated Strategies for Managing Antimicrobial Resistance in Western & Central African Aquaculture: A Cross-Disciplinary Approach to Enhancing Aquatic Animal Health, Food Security, Food Safety, and Environmental Sustainability*'. The objective is to raise awareness and enhance capabilities in the use of nuclear and complementary tools and techniques for analyzing and monitoring the occurrence of antimicrobial residues and antimicrobial resistance in aquaculture.

20. The course will focus on how advancements in laboratory analysis and field experiments can enable Member States to effectively respond to the global challenge of antimicrobial resistance within the One Health approach. The training programme will comprise four modules: (1) Understanding the global challenges posed by Antimicrobial Resistance under the One Health perspective; (2) Technological solutions for detection, mitigation and control of bacteria and AMR in aquaculture systems; (3) Understanding the fate of antimicrobials and AMR in aquaculture; (4) Analytical approaches and considerations for monitoring key antimicrobial residues in aquaculture products.

TECHNICAL COOPERATION PROJECTS

21. The Joint FAO/IAEA Centre is supporting capacity-development national and regional technical cooperation projects (see Table 1 highlighting selected projects).

Table 1: Overview of selected IAEA Technical Cooperation projects supported by the Joint FAO/IAEA Centre

Number	Country/Region	Project No.	Title
1	Azerbaijan	AZB5005	Strengthening Laboratory Capacity to Analyse and Monitor Residues and Contaminants in Foods
2	Bahamas	BHA5003	Strengthening Laboratory Capacity for Testing Microbial and Related Chemical Contaminants in Food Products
3	Bangladesh	BGD5034	Enhancing Competence in Nuclear and Complementary Capabilities for Testing/Monitoring Veterinary Drug Residues and Other Contaminants in Foods
4	Barbados	BAR5001	Enhancing Capability for Food Safety and Surveillance through the Development of Nuclear, Isotopic and Complimentary Analytical Methods
5	Bosnia Herzegovina	BOH5005	Strengthening Laboratory Capacity by Developing and Introducing a Method for the Determination of Pesticides in Foods of Animal Origin
6	Brunei	BRU5001	Enhance Food Safety, Food Security and Trade Facilitation through Nuclear Technology
7	Cameroon	CMR5028	Improving the Capacity for Food Safety Testing Using Nuclear and Complementary Techniques
8	Comoros	COI5001	Building a Food Safety Laboratory Capacity in Comoros — Phase I
9	Cote d'Ivoire	IVC5045	Strengthening National Analytical Capacities for Food Safety Testing and Assessing Micronutrient Bioavailability in Local Diets
10	Democratic Republic of the Congo	COD5013	Using Nuclear Techniques to Improve Crop Productivity for Maize, Soybeans and Beans, as well as Food Safety Testing Capabilities
11	Djibouti	DJI5001	Developing Nuclear/Isotopic and Complementary Food Safety Testing Capabilities
12	Dominica	DMI5004	Establishing a National Food Safety Monitoring Surveillance Programme
13	Eritrea	ERI5019	Improving the Quality Management Systems of Food Safety Testing Laboratories in Eritrea
14	Fiji	FIJ5009	Implementing the Accreditation Standards of the European Union for Enhancing the Credibility of the Fiji Agricultural Chemistry Laboratory
15	Ghana	GHA5040	Enhancing Capacity for Scaling Nuclear Science and Technology for Sustainable Food Security and Safety
16	Georgia	GEO5002	Strengthening Laboratory Analytical Capacity for Monitoring Food Contaminants

Number	Country/Region	Project No.	Title
17	Grenada	GRN5001	Enhancing Analytical Capabilities for Food Safety Testing and Surveillance
18	Honduras	HON5012	Strengthening Analytical Capabilities for the Detection of Residues, Contaminants and Microbiological Hazards in Food and Feed
19	Ivory Coast	IVC5045	Strengthening National Analytical Capacities for Food Safety Testing and Assessing Micronutrient Bioavailability in Local Diets
20	Jordan	JOR5011	Enhancing Food Security and Safety by Utilizing Nuclear Techniques in Agriculture
21	Kuwait	KUW5008	Improving Food Safety Through the Detection of Chemical and Microbiological Hazards in Milk
22	Lesotho	LES5011	Strengthening Nuclear and Related Food Safety Laboratory Capabilities to Control Veterinary Drug Residues and Related Contaminants
23	Malawi	MLW5007	Enhancing Capabilities to Test, Monitor and Control Contaminants and Chemical Residues in Foods
24	Mauritania	MAU5011	Enhancing Intersectoral Food Safety Testing and Surveillance of Chemical and Biological Hazards
25	Mozambique	MOZ5015	Enhancing Laboratory Competence to Investigate Contaminants in Aquaculture Fish Products Using Nuclear Techniques
26	Myanmar	MYA5031	Strengthening Food Safety Chemical Hazard Testing and Monitoring Capabilities
27	Nicaragua	NIC5013	Advancing Testing and Diagnostic Capacities of National Agriculture Laboratories
28	Niger	NER5026	Enhancing Food Production, Preservation, Safety and Quality
29	Oman	OMA5011	Capacity Building for Food Safety and Quality Control
30	Palau	PWL5005	Building Core Capacities to Control Contaminants and Other Residues in Food — Phase I
31	Paraguay	PAR5014	Integration of Nuclear Analytical Techniques into Food Safety Assessments in Paraguay with a View to Food Security
32	Romania	ROM5011	Strengthening Food Safety and Quality Testing Capabilities
33	Samoa	WSM5002	Building Core Capacity to Control Contaminants and Residues in Food - Phase II
34	Senegal	SEN5043	Developing the Capacity to Conduct an Assessment of Exposure to Chemical Hazards in Food and to Evaluate the Nutritional Composition of Local Dishes

Number	Country/Region	Project No.	Title
35	Seychelles	SEY5015	Strengthening Testing Capacity and Capabilities for Food Contaminants and Toxins in Using Nuclear and Complimentary Analytical Techniques
36	Sri Lanka	SRL5056	Enhancing Capacity for Physical, Chemical and Microbiological Hazard Detection and Control in Milk
37	Saint Kits and Nevis	STK5001	Strengthening National Food Safety Analytical Capacity
38	Syria Arab Republic	SYR5027	Enhancing Food Safety Analytical Capabilities for Microbial and Chemical Contamination
39	Togo	TOG5008	Capacity Building of Laboratories for Quality Control of Foodstuffs and Pharmaceutical Products Phase II
40	Tunisia	TUN5053	Strengthening Food Safety Capabilities
41	United Republic of Tanzania	URT5038	Developing Food Safety Laboratory Capabilities in Zanzibar
42	Vanuatu	NHE5005	Strengthening Agro-Food Laboratory Quality Infrastructure – Phase III
43	Regional - Asia and the Pacific	RAS5102	Promoting Resilient and Sustainable Agrifood Systems through Innovative Nuclear and Related Techniques
44	Regional - Asia and the Pacific	RAS5103	Climate Smart Agricultural Practices for Enhancing and Strengthening the Capacities of Food Security and Safety, and Conserving Natural Resources Using Nuclear and Related Techniques (ARASIA)
45	Regional - Latin America and the Caribbean	RLA5093	Enhancing Food Security and Sustainability of Agrifood Systems Farm to Fork through the Integration of Advanced Nuclear Techniques (ARCAL CXCVIII)
46	Regional - Africa	RAF5091	Enhancing Human and Analytical Capacities for Food Safety Standards (AFRA)

RECOMMENDATION

22. CCRVDF28 is invited to note the information contained in this document.