

WOAH Collaborative Centre Reports Activities 2023

Activities in 2023

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Centre Information

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TOR1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOA

Category	Title of activity	Scope
Food security (true)	State monitoring of food safety	As part of state quality and safety monitoring, the FGBU «VGNKI» carries out an annual program of research on chemical contaminants (antibacterial agents, hormonal growth promoters and other animal drugs, heavy metals, persistent organic pollutants, pesticides, mycotoxins, etc.), as well as adulteration (dairy products with non-vegetable fats, meat/fish products with meat of undeclared animal species) and microbiological contaminants. Studies are conducted in food products of animal origin (meat, offal, milk, fish, honey, meat, and dairy products), feedingstuffs, and feed supplements as well as animal biomaterial. In 2023, FGBU «VGNKI» performed 20 842 tests in 7690 samples, approx. 3 tests per one sample. 4900 samples were of domestic origin (70%). Samples of foreign origin were from Belarus, Serbia, Brazil, Uruguay, Argentina, Iran, China and other countries. The highest percent of positive tests (12.2%) was in the category of «wild game», due to the presence of mercury and cadmium in the reindeer offal (kidneys and liver). In honey hydroxymethylfurfural and antimicrobial residues were found (2.9% of positive tests). Positive

		<p>findings of antimicrobials in honey may be explained by the zero tolerance for almost all veterinary drug residues in honey according to the EAEU legislation. Meat and offal (bovine, swine, horse), poultry and meat products were contaminated by antimicrobials, coccidiostats, pathogenic microorganisms (Salmonella and Listeria), and foreign DNA, fish – by heavy metals, tryphenylmethane dyes and tetracyclines. Antimicrobials and sorbate and benzoate preservatives above the MRL were found in milk and milk products. 3.2% of milk product samples were adulterated by plant oil and bovine visceral fat. Eggs were contaminated predominantly by coccidiostat residues. The percent of positive tests for the abovementioned categories was in the range of 0.3-2.7%. No positive findings were made in ovine and rabbit meat and offal as well as wild aquatic invertebrates.</p>
<p>Feed safety (true)</p>	<p>State monitoring of feed safety</p>	<p>As part of state quality and safety monitoring, the VGSKI carries out an annual program of research on chemical contaminants (antibacterial agents, hormonal growth promoters and other animal drugs, heavy metals, persistent organic pollutants, pesticides, mycotoxins, etc.), as well as adulteration (dairy products with non-vegetable fats, meat/fish products with meat of undeclared animal species) and microbiological contaminants. Studies are conducted in food products of animal origin (meat, offal, milk, fish, honey, meat, and dairy products), feedingstuffs, and feed supplements as well as animal biomaterial. In 2023, VGSKI performed 20 842 tests in 7690 samples, approx. 3 tests per one sample. Samples of foreign origin were from Belarus, Serbia, Brazil, Uruguay, Argentina, Iran, China and other countries. Among these samples 1287 were of feed and feed additives. 80 positive samples were detected (6.2%) of feed samples, which were non-complaint with EAEU safety and quality regulations, due to chemical and microbiological contamination above the maximum levels and adulteration. Positive finding in feed and feed additives (4.6%) were attributed to heavy metals, GMO and foreign DNA (undeclared species), and in invertebrates – to heavy metals, tryphenylmethane dyes and tetracyclines.</p>
		<p>VGSKI is implementing a research project called "Veterinary monitoring of bacterial resistance to antimicrobial agents" (hereinafter referred to as R&D). As part of the R&D for the year 2023, 1185 bacterial isolates were isolated, including: Enterococcus spp. - 582, Escherichia coli - 482, S. aureus - 28, Campylobacter spp. - 10, Listeria monocytogenes - 38, Salmonella spp. - 45. Proportion of multi-resistant isolates (simultaneous resistance to three or more classes), according to EUCAST interpretation (European Committee on Antimicrobial Susceptibility Testing): - Escherichia coli – 11,38 %, - Salmonella spp. – 72.55%, - Enterococcus spp. – 6,35 %, - Listeria monocytogenes – 10,68 % - S. aureus – 80,95 %. For a comprehensive study of multidrug-resistant bacterial isolates, 3 isolates of Listeria monocytogenes and 3 isolates of Staphylococcus aureus with phenotypic resistance to antibiotics of different classes were analyzed by full genome sequencing in 2023. In the course of bioinformatic analysis the following activities were conducted: sourcing and annotation</p>

<p>Antimicrobial resistance (true)</p>	<p>Studies on antimicrobial resistance</p>	<p>of assemblies of draft versions of genomes, determination of species affiliation and sequencing types of isolates, search for resistance determinants and pathogenicity factors. Utilizing previously developed PCR methods the metagenomic samples from environmental objects were tested for 12 resistance genes to different antibiotic groups: penicillins, cephalosporins (CMY, CTX-M-1, CTX-M-9), colistin (mcr-1), fluoroquinolones (qnrS, qnrB), tetracyclines (tetA, tetM, tetO), aminoglycosides (aadA genes), sulfonamides (sul1) and trimethoprim (dfrA12). Within the framework of R&D, the most scientifically interesting strains of microorganisms are regularly deposited, and are later used as controls in conducting studies to test the sensitivity of microorganisms to antibiotics, as well as in the diagnosis of infectious diseases (salmonellosis, campylobacteriosis, etc.) Within the framework of the grant "Formation of a network bioresource collection of reference strains of microorganisms for state needs (quality control of nutrient media, veterinary drugs in circulation, agricultural products, foodstuffs and the state of objects of cultural heritage). The laboratory staff completed the development and testing of a method of laboratory control of immunogenic activity of vaccines against brucellosis in animals using reference attenuated strain Brucella abortus for infection of laboratory animals. As part of the first stage of R&D "Development of vaccine against animal colibacillosis" in 2023, the properties of epizootic isolates were studied and promising strains that possess the entire package of immunologically significant virulence factors of E.coli for the creation of a vaccine against colibacillosis in farm animals, were selected. For the purpose of practical implementation of the results of the R&D "Development of bacteriophage drug for treatment and prevention of salmonellosis in piglets" employees of the scientific and technological laboratory on the basis of FKP "Armavir Biofactory" received in 2023 industrial batches of bacteriophage for further registration of the drug and its application for treatment and prevention of salmonellosis in pigs - as an alternative to antibacterial drugs. Prepared amendments to the Veterinary rules for the implementation of preventive, diagnostic, restrictive and other measures, establishment and abolition of quarantine and other restrictions aimed at preventing the spread and elimination of outbreaks of brucellosis (including infectious epididymitis of rams) Ratified by the Order No 533 from 08.09.2020.</p>
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TOR3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable area
<p>Methodological support for monitoring residues of veterinary</p>	<p>New compounds - nitroxoline, clioquinol and methylbenzoquat - MRL for nitroxoline (Regulation EU № 37/2010) – 20-400 mcg/kg for organs and tissues of cattle, sheep and goats - MRL for methylbenzoquat (prohibited for use, included in the export</p>	<p>Laboratory expertise</p>

pharmaceuticals in livestock products	requirements of countries in the Asia-Pacific region): South Korea - 10 mcg/kg in poultry meat, Australia and Saudi Arabia - 100 mcg/kg for meat, chicken liver and kidneys	Training and education
Determination of beta-adrenergic agonists in raw materials for food products	New compounds bambuterol and formoterol (prohibited in China)	Laboratory expertise
Determination of antiprotozoal drugs in livestock products	Newly synthesized compounds: pyrimethamine, diaveridine, buparvaquone, isomethamidium - MRL on diaveridine is identified in Japan for poultry meat - Buparvaquone is included in the export requirements of countries in the Asia-Pacific region - MRL of Codex Alimentarius on isometamidium for cattle – 100-1000 mcg/kg for different organs and tissues	Laboratory expertise
Identification of genetically engineered bacteria	Differential identification of producer strains	Laboratory expertise
Determination of adulteration cases in fish products	Identification of saury and tilapia	Laboratory expertise

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOA?H?

No

4. Did your Collaborating Centre maintain a network with other WOA?H Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Institute of Engineering Immunology, Moscow State Academy of Veterinary Medicine and Biotechnology named after Scriabin and Kingston University (UK)	United Kingdom	Europe	Mega-grant "Creation of means for the prevention of socially significant infections of productive animals based on modern methods of nutrigenomics"
Interregional Association for Clinical Microbiology and Antimicrobial Chemotherapy (member of FEMS)	Smolensk, Russia	Europe	Scientific cooperation on antimicrobial resistance
Alltech, European Bioscience Centre (with Dr. Richard Murphy)	Dunboyne, Ireland	Europe	Mega-grant "Creation of means for the prevention of socially significant infections of productive animals based on modern methods of nutrigenomics"
Federal State Budgetary Institution "National Center for the Safety of Aquatic Products and Aquaculture"	Moscow, Russia	Europe	2 R&D projects: "Development of methods for determining prohibited and harmful substances in food products and feed", as well as "Determination of falsification of fish products using real-time PCR"

TOR4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHC Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of WOAHC CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Federal State Budgetary Institution "Federal Scientific Center for Food Systems named after V.M. Gorbatov"	Moscow, Russia	Europe	- Fundamental research on the movement of pathogenic microorganisms and viruses in food systems - Depositioning and storage of pathogenic microbial strains in food systems

TOR6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOAHC?

Yes

NAME OF EXPERT	KIND OF CONSULTANCY	SUBJECT
Ivanova Olga, head of Testing Center, VGNI	Round table of experts as part of the World Antimicrobial Awareness Week (Together with FAO, WHO, WOAHC, UNEP)	AMR
Ekaterina Agrinskaya, head of Certification Body, VGNI	- Organic crop production, livestock farming, beekeeping, aquaculture, mushroom production, processing of organic crop and livestock products, feed production (in compliance with GOST 33980-2016 "Products of organic production. Rules for production, processing, labeling and sales") - Collection, procurement and processing of wild-growing raw materials (in compliance with GOST R 59425-2021 "Organic products from wild-growing raw materials. Rules for collection, procurement, processing, storage, transportation and labeling") - Medicinal products for veterinary use - Feed for productive and non-productive animals, amino acids (lysine, methionine), compound feed, concentrates, protein-vitamin-mineral concentrates, premixes, feed yeast, vitamins, enzyme preparations, feed meal and other feed products - Cosmetics for animal care - Disinfectants for use in veterinary medicine - Sperm of bulls, buffaloes, boars, rams, goats, stallions, donkeys and dogs - Media for dilution, storage and cryopreservation of semen - Meat and fish products, including for storage in the state reserve	State-level certification of food and feed products, certification of organic produce

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

Yes

Within the signed agreement on technical and scientific cooperation, VGNI conducted a series of meetings and trainings with the specialists of Azerbaijan Food Safety Institute on the topic food safety and security. In addition, VGNI has an ongoing cooperation with General Administration of Customs of China in relation to export of pork products and poultry products to China. Within this collaboration, in 2023, 3 samples of meat products, 40 samples of crustaceans and mollusks, and 89 samples of fish and fish products were tested by specialists of VGNI

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOA, to personnel from WOA Members?

Yes

a) Technical visit : 2

b) Seminars : 5

c) Hands-on training courses: 0

d) Internships (>1 month) : 13

TYPE OF TECHNICAL TRAINING PROVIDED (A, B, C OR D)	CONTENT	COUNTRY OF ORIGIN OF THE EXPERT(S) PROVIDED WITH TRAINING	NO. PARTICIPANTS FROM THE CORRESPONDING COUNTRY
B	- Validation of microbiological control methods - State registration of feed additives - Microbiology. Sanitary and epidemiological requirements and rules for working with pathogenic biological agents - Determination of residual content of azithromycin, kitasamycin, tildipirosin in food products by high-performance liquid chromatography with mass spectrometric detection - Organization of warehousing of raw materials, materials and products	Belarus	5
D	In accordance with the existing license to carry out educational activities in postgraduate school, VGNKI offers a program "4.2.2. Sanitation, hygiene, ecology, veterinary and sanitary examination and biosafety"	Russia	13
A	Laboratory consultations on the topics of food safety and security	Azerbaijan, China	9

TOR8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOA?

Yes

NATIONAL/INTERNATIONAL	TITLE OF EVENT	CO-ORGANISER	DATE (MM/YY)	LOCATION	NO. PARTICIPANTS
International	Creation of means for prevention of socially significant infections of farm animals (organized by A. Panin)	FAO, WHO, WOA, UNEP	2023-12-22	Moscow, Russia	150

TOR9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOA that may be useful to Members of WOA

a) Articles published in peer-reviewed journals:

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1. MODERN SAMPLE PREPARATION METHODOLOGY FOR DETERMINING PESTICIDE RESIDUAL QUANTITIES IN ENVIRONMENTAL OBJECTS, BIOLOGICAL MATERIALS AND FOOD PRODUCTS (DOI: 10.6060/ivkkt.20236612.6799)

Lavrukhina O.I., Amelin V.G., Kish L.K., Tretyakov A.V. *News of higher educational institutions. Series: Chemistry and chemical technology.* 2023. Vol. (66). № 12, pp. 6-24.

2. SCREENING OF SAMPLES AND SIMULTANEOUS DETERMINATION OF RESIDUAL CONTENTS OF 80 DRUGS IN FOOD PRODUCTS USING HPLC-MS/MS (DOI: 10.26896/1028-6861-2023-89-8-12-22)

Amelin V.G., Batov I.V., Lavrukhina O.I., Tretyakov A.V., Kish L.K. *Factory laboratory. Diagnostics of materials.* 2023. Vol. (89) No. 8, pp. 12-22.

3. ESTABLISHING SEAFOOD SPOILAGE BY DIGITAL COLORIMETRY METHOD OF INDICATOR TEST SYSTEMS (DOI: 10.26896/1028-6861-2023-89-9-25-33)

Amelin V.G., Shaoka Z.A.Ch., Bolshakov D.S., Tretyakov A.V., Nesterenko I.S., Kish L.K. *Factory laboratory. Diagnostics of materials.* 2023. Vol. (89). No. 9, pp. 25-33.

4. ESTABLISHING THE FALSIFICATION OF BUTTER BY THE COLORIMETRIC METHOD USING A SMARTPHONE AND CHEMOMETRIC ANALYSIS (DOI: 10.6060/ivkkt.20236602.6717)

Amelin V.G., Shaoka Z.A.Ch., Bolshakov D.S., Tretyakov A.V. *News of higher educational institutions. Series: Chemistry and chemical technology.* 2023. Vol. (66) No. 2, pp. 53-61.

5. NON-TARGET ANALYSIS OF ANIMAL PRODUCTS AND FEED FOR RESIDUAL CONTENTS OF DRUGS, PESTICIDES, MYCOTOXINS AND THEIR METABOLITES BY HIGH-RESOLUTION MASS SPECTROMETRY (REVIEW) (DOI: 10.26896/1028-6861-2023-89-11-5-13)

Kish L.K., Lavrukina O.I., Amelin V.G., Tretyakov A.V., Penkov T.D., Nekrasov D.Yu. *Factory laboratory. Diagnostics of materials.* 2023. Vol. (89). No. 11, pp. 5-13.

6. OPTIMIZATION OF SAMPLE PREPARATION CONDITIONS WHEN DETERMINING THE TOTAL ARSENIC CONTENT IN FISH AND SEAFOOD BY ATOMIC ABSORPTION SPECTROMETRY WITH ELECTROTHERMAL ATOMIZATION (DOI: 10.26896/1028-6861-2023-89-1-5-10)

Grachev S.A., Tretyakov A.V., Amelin V.G. *Factory laboratory. Diagnostics of materials.* 2023. Vol. (89). No. 1, pp. 5-10.

7. IDENTIFICATION AND AUTHENTICATION OF VEGETABLE OILS BY DIGITAL COLORIMETRY AND CHEMOMETRIC ANALYSIS (DOI: 10.26896/1028-6861-2023-89-2-1-5-12)

Amelin V.G., Shaoka Z.A.Ch., Bolshakov D.S., Tretyakov A.V. *Factory laboratory. Diagnostics of materials.* 2023. Vol. (89). No. 2-1, pp. 5-12.

8. DEVELOPMENT AND VALIDATION OF PCR-TECHNIQUES FOR DETECTING AADA GROUP GENES PROVIDING RESISTANCE TO AMINOGLYCOSIDES IN BACTERIA OF THE ENTEROBACTERIACEAE FAMILY

Krylova E.V., Osipova Yu.A., Leukhina O.O., Timofeeva I.A., Soltynskaya I.V., Bogomazova A.N., Borunova S.M., Ivanova O.E., Kish L.K. *Clinical microbiology and antimicrobial chemotherapy.* 2023. Vol. (25). No. S1, pp. 34-35.

9. MICROBIOLOGICAL CONTAMINATION OF FOOD RAW MATERIALS AND PREPARED FOOD PRODUCTS (ANALYTICAL REVIEW) (DOI: 10.21603/2074-9414-2023-3-2451)

Khishov A.S., Balagula T.V., Lavrukina O.I., Tretyakov A.V., Ivanova O.E., Kozeicheva E.S. *Equipment and technology of food production.* 2023. Vol. (53). No. 3, pp. 486-503.

10. WHOLE-GENOME SEQUENCING OF HISTOPHILUS SOMNI STRAINS ISOLATED IN RUSSIA (DOI: 10.14202/vetworld.2023.272-280)

Yatsentyuk S.P., Pobolelova Ju., Gordeeva V.D., Timofeeva I. *Veterinary World.* 2023. Vol. (16). No. 2, pp. 272-280.

b) International conferences:

1

1. Milyukova N., Pirsikov A., Petrov A., Surugin M. *Analysis of tomato breeding samples of alleles of resistance genes to meloidoginosis and tomato mosaic virus. Plant Genetics, Genomics, Bioinformatics, and Biotechnology (PlantGen2023): abstracts.* Edited by A.A. Kalachev, T.A. Gorhkova, M.L. Ponomareva; FIC KazSC RAS. The 7th International Scientific Conference (July 10–15, 2023, Kazan, Russia). Kazan: FEN, 2023, p. 266.

c) National conferences:

4

1. Akinina T.N., Osipova YU.A., Soltynskaya I.V., Krylova E.V., Vostrikova O.V. *Development of a set of reagents for the detection of genetically modified rice by multiplex PCR with detection in real time. Molecular Diagnostics, Proceedings, composite author. Moscow: AO "Science Media Projects", 2023, pp.371-372.*

2. Putintseva A.V., Kirsanova N.A., Bogomazova A.N., Krylova E.V., Soltynskaya I.V., Gergel M.A. *Development of molecular genetic method to detect genetically modified Atlantic salmon AquAdvantage Salmon. Molecular Diagnostics, Proceedings, composite author. Moscow: AO "Science Media Projects", 2023, pp.383-384.*

3. Soltynskaya I.V., Bogomazova A.N., Krylova E.V., Kirsanova N.A., Timofeeva I.A., Putintseva A.V., Zaitseva E.V., Gergel M.A. *Development of molecular genetic methods for semi-quantitative assessment of animal DNA content in meat products. Molecular Diagnostics, Proceedings, composite author. Moscow: AO "Science Media Projects", 2023, pp.381-382.*

4. Lugovaya I.S., Azarova T.O., Bachinskaya N.A., Burlakova G.I., Kravchenko A.L. *"The influence of ammonium succinate on the biocontrol indicators of chickens" Collection of highly efficient technologies in the agro-industrial complex, Yelets, 2023, p. 130-131. Collection of materials of the III All-Russian Scientific and Practical Conference.*

d) Other (Provide website address or link to appropriate information):

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11. What have you done in the past year to advance your area of focus, e.g. updated technology?

Based on the methodological developments of VGNKI, 9 methods were approved and included in the Federal Register. All methods and procedures, which are developed by the VGNKI on a federal level and implemented in the field of food safety, comply with international standards and guidelines (including those implemented within the framework of GOST ISO/IEC 17025-2019). Control activities also use procedures that are harmonized with international ones (including methods of food analysis that meet international criteria: high-performance liquid and gas chromatography with tandem mass spectrometric resolution and in combination with high-resolution mass spectrometry, inductive mass spectroscopy coupled plasma, MALDI)

1) MY A-1/043 «Guidelines for the determination of glyphosate and its metabolic products in feed and feed raw materials» (put into effect on 03.03.2023)

2) MY A-1/090 «Guidelines for determining the residual content of quinolones in livestock products using high-performance liquid chromatography with mass spectrometric detection» (put into effect on 28.06.2023)

3) MY A-1/092 «Guidelines for the determination of 3-MCPD and glycidol in fat-containing food products using gas-liquid chromatography with mass spectrometric detection» (put into effect on 10.07.2023)

4) MY A-1/101 «Guidelines for the determination of phthalates in food products of animal origin using gas-liquid chromatography with mass spectrometric detection» (put into effect on 07.07.2023)

5) MY A-1/102 «Guidelines for determining the residual content of non-steroidal anti-inflammatory drugs in livestock products using high-performance liquid chromatography with mass spectrometric detection» (put into effect on 01.06.2023)

6) MY A-1/103 «Guidelines for determining the residual content of chloramphenicol in livestock products using high-performance liquid chromatography with mass spectrometric detection» (put into effect on 14.04.2023)

7) MY A-1/104 «Guidelines for determining the residual content of nitrofurans in livestock products using high-performance liquid chromatography with mass spectrometric detection» (put into effect on 14.04.2023)

8) MY A-1/105 «Guidelines for the determination of hormonal drugs in livestock products and biological fluids using high-performance liquid chromatography with mass spectrometric detection» (put into effect on 30.06.2023)

9) MY A-1/108 «Guidelines for determining the content of glyphosate and aminomethylphosphonic acid in raw materials of plant origin» (put into effect on 10.07.2023)

12. Additional comments regarding your report:

No comments