

WOAH Collaborative Centre Reports Activities 2023

Activities in 2023

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Centre Information

Title of WOA Collaborating Centre	WOAH Collaborating Centre for Diagnosis and Control of Viral Animal Diseases in Eastern Europe, Central Asia and Transcaucasia
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Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):	Ilya Chvala, Deputy director for research
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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
Disease control (true)	1) Infectious disease diagnosis in the Russian Federation 2) Infectious disease diagnosis in other	1) Missions (57) of the FGBI "ARRIAH" experts for advisory assistance in animal disease diagnosis, collection of pathological samples, arrangement and implementation of anti-epidemic measures: For control/prevention of bovine , ovine and caprine diseases (9) : FMD, lumpy skin disease, sheep and goat pox (Vladimir Oblast, Zabaykalsky Krai, Republic of Khakassia, Republic of Udmurtia) For control/prevention of porcine diseases (30), including: 16 - ASF (Saratov Oblast, Vologda Oblast, Voronezh Oblast, Belgorod Oblast, Republic of Khakassia, Krasnodar Krai, Krasnoyarsk Krai, Stavropol Krai, Primorsky Krai); 14 – Other porcine diseases: pneumonic pasteurellosis, atrophic rhinitis, Glasser's disease, PRRS, Aujeszky's disease, parvovirus infection, influenza, circovirus infection, enzootic pneumonia, actinobacillus pleuropneumonia (Oryol Oblast, Kursk Oblast, Penza Oblast, Kaliningrad Oblast, Ulyanovsk Oblast, Republic of Mordovia, Republic of Bashkortostan, Republic of Tatarstan, Republic of Crimea, Altai Krai and Perm Krai. For control/prevention of avian diseases - 30 Stavropol Krai, Tyumen Oblast (2),

	countries	Bryansk Oblast, Chelyabinsk Oblast, Sakhalin Oblast, Khabarovsk Oblast, Moscow Oblast, Krasnoyarsk Krai, Komi Republic, Kemerovo Oblast, Kostroma Oblast, Tomsk Oblast, Republic of Dagestan, Leningrad Oblast - 2, Tula Oblast, Kursk Oblast - 2, Republic of Mari El, Kazan, Komi Republic, Republic of Udmurtia (3), Vologda Oblast, Republic of Bashkortostan, Omsk Oblast, Perm Oblast, mission to Tyumen Oblast. For control/prevention of fish diseases (7) Republic of Karelia, Murmansk Oblast, Leningrad Oblast. 2) Missions (16) of the FGBI "ARRIAH" experts to foreign countries for advisory assistance in animal disease diagnosis, arrangement and implementation of anti-epidemic measures: For control/prevention of bovine, ovine and caprine diseases (6): Thailand, Islamic Republic of Pakistan, Republic of Kyrgyzstan, Republic of Uzbekistan, Brazil, People's Republic of China); For control/prevention of avian diseases (8): Republic of Belarus (5), Republic of Kazakhstan (2) , Republic of Türkiye (video-inspection).
Zoonoses (true)	1) Rabies monitoring 2) Bovine spongiform encephalopathy monitoring 3) COVID-19 monitoring	1) 1,091 rabies tests of samples from 20 RF Subjects were performed: fluorescent antibody technique (FAT) – 555 tests; virus isolation in cell culture – 536 tests. 2) 18,827 ELISA tests for BSE were carried out on pathological materials from 75 RF Subjects 3) 744 tests for COVID-19 were performed: PCR - 445 samples (foxes, raccoon dogs, mice, wild birds, hares and rabbits, zoo monkeys); ELISA -302 samples (rabbits, sables).
Avian diseases (true)	1) Newcastle disease monitoring 2) Avian influenza monitoring	1) 45,103 tests for Newcastle disease were carried out on samples from 76 RF Subjects - real-time RT PCR – 6,120 tests; - ELISA – 32,828 tests; - HI – 6,095 tests; - virus isolation – 70 tests; - nucleotide sequencing – 160 tests. Newcastle disease tests of samples submitted from foreign countries: - 10 diagnostic tests of samples delivered from the Republic of Belarus (PCR); - 4 tests of samples delivered from the Republic of Kazakhstan (PCR); -4990 tests of samples submitted from the Republic of Belarus (ELISA); - 108 tests of samples submitted from the Republic of Kazakhstan (ELISA). 2) 48,818 tests for avian influenza were carried out on samples from 76 RF Subjects: - real-time RT PCR – 6,860 tests; - ELISA – 36,190 tests; - HI test – 5, 542 tests; - virus isolation – 226 tests; - nucleotide sequencing – 345 tests. Avian influenza tests of samples submitted from foreign countries: - 10 tests of samples submitted from the Republic of Belarus (PCR); - 4 tests of samples submitted from the Republic of Kazakhstan (PCR); - 4990 tests of samples submitted from the Republic of Belarus (ELISA); - 108 tests of samples submitted from the Republic of Kazakhstan (ELISA).
Aquatic animal diseases (true)	1) Spring viraemia of carp diagnosis 2) Infectious hematopoietic necrosis diagnosis 3) Viral haemorrhagic septicaemia diagnosis 4) Infectious pancreatic necrosis diagnosis 5) Infectious salmon anaemia diagnosis 6) Epizootic haematopoietic necrosis diagnosis 7) Diagnosis of alphavirus	1) 414 diagnostic tests of samples from 31 RF Subjects were performed: - 190 ELISA tests; - 224 virus isolations. 2) 626 diagnostic tests of samples from 34 RF Subjects were performed: - 371 ELISA tests; - 42 PCR tests; - 213 virus isolations in CC. 3) 623 diagnostic tests of samples from 35 RF Subjects were performed: - 372 ELISA tests; - 39 PCR tests; - 212 virus isolations in CC. 4) 621 diagnostic tests of samples from 35 RF Subjects were performed: - 370 ELISA tests; - 39 PCR tests; - 212 virus isolations in CC. 5) 338 diagnostic PCR tests of samples from 35

	<p>infection in salmonids 8) Diagnosis of infection with koi herpesvirus</p>	<p>RF Subjects were performed 6) 255 diagnostic tests of samples from 16 RF Subjects were performed: - 4 virus isolations in CC; - 251 PCR tests. 7) 37 diagnostic tests of samples from 6 RF Subjects were performed: - 4 virus isolations in CC; - 33 PCR tests. 8) 5 diagnostic PCR tests of samples from 2 RF Subjects were performed</p>
<p>Diagnosis, biotechnology and laboratory (true)</p>	<p>1) Bluetongue diagnosis 2) Classical swine fever diagnosis 3) African swine fever diagnosis 4) Schmallenberg disease diagnosis 5) Lumpy skin disease diagnosis 6) FMD diagnosis in the Russian Federation 7) FMD tests of samples from foreign countries 8) Peste des petits ruminants diagnosis 9) Sheep and goat pox diagnosis 10) Contagious bovine pleuropneumonia diagnosis</p>	<p>1) 9,659 tests of samples from 45 RF Subjects were performed (8,233 ELISA tests of bovine/ovine and caprine sera for bluetongue virus; 1,426 PCR tests of biological samples) 2) 6,066 tests of samples from 53 RF Subjects were performed: - 3,244 ELISA tests; - 2,812 real-time RT PCR tests for CSFV genome; - 10 virus isolations in CC. 3) 25,062 diagnostic tests of samples from 71 RF Subjects were performed: - 17,642 real-time RT PCR tests for ASFV genome; - 6,074 ELISA tests for Abs to ASFV; - 1,346 virus isolations in CC. 4) 1,839 tests of samples from 13 RF Subjects were performed - 175 sera samples were tested for antibodies with ELISA; - 1,664 PCR tests. 5) 9,575 tests of samples from 67 RF Subjects were performed - 1,324 samples by ELISA; - 8,251 samples by PCR. 6) 311,159 samples from 85 RF Subjects were tested: Indirect diagnostic tests: - Liquid phase blocking indirect ELISA (LPB ELISA) – 219,958 tests of sera for FMDV NSP antibodies; - Virus neutralization test (VNT) – 14,053 tests of sera; - Indirect ELISA-NSP – 71,737 tests of sera for FMDV NSP antibodies; - Antigenic matching by MNT – 131 tests. Direct diagnostic tests: - Virus isolation in CC – 474 tests; - Indirect double sandwich ELISA – 474 tests of biological samples; - CFT – 474 tests; - real-time RT-PCR, 3D gene – 1,929 tests; - real-time RT-PCR, 5'HTO gene – 1,929 tests. 7) 1,426 tests of samples submitted from foreign countries (Jordan, Uganda) were performed. Indirect diagnostic tests: - Liquid phase blocking indirect ELISA (LPB ELISA) – 570 tests of sera for FMDV NSP antibodies; - Virus neutralization test (VNT) – 570 tests of sera; - Indirect ELISA-NSP – 190 tests; - Antigenic matching by MNT – 12 tests. Direct diagnostic tests: - Virus isolation in CC – 15 tests; - Indirect double sandwich ELISA – 5 tests of biological samples; - real-time RT-PCR, 3D gene – 20 tests; - real-time RT-PCR, 5'HTO gene – 20 tests; - RT-PCR, VP1 gene – 12 tests; - VP1 gene sequencing – 12 tests. 8) 20,199 tests of samples from 85 RF Subjects were performed: - 20,048 sera were tested in ELISA; - 124 biological samples were tested by PCR; - 27 samples were tested by VNT. 9) 1,335 tests of samples from 14 RF Subjects were tested: -726 samples were tested with PCR; - 609 samples were tested with ELISA. 10) 23,718 tests of samples from 83 RF Subjects were tested. -2,025 samples were tested by PCR; - 21,693 samples were tested by ELISA.</p>
<p>Feed safety (true)</p>	<p>Food safety monitoring</p>	<p>59,151 tests of samples from 58 RF regions were carried out. Test methods: physico-chemical, microbiological, radiological, ELISA, real-time PCR</p>

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
Methodical Guidelines for assessment of indoor-keeping poultry holdings biosecurity system for its effectiveness	Avian disease surveillance and prevention	Laboratory expertise health management
Methodical Guidelines for assessment of pig holding biosecurity system for its effectiveness within the framework of contagious porcine disease introduction and spread risk audit	Porcine disease surveillance and prevention	Laboratory expertise health management
Methodical Guidelines for differentiation of laboratory-attenuated and field African swine fever virus strains by polymerase chain reaction with electrophoretic detection	Classical swine fever surveillance and laboratory diagnosis	Laboratory expertise health management
Methodical Guidelines for detection of African swine fever virus genome with nested PCR with electrophoretic detection	African swine fever surveillance and laboratory diagnosis	Laboratory expertise health management
Methodical Guidelines for lumpy skin disease virus genome editing using overlap-extension PCR and CRISPR-CAS9 technology	Lumpy skin disease surveillance and laboratory diagnosis	Laboratory expertise health management
Methodical Guidelines for detection of antibodies against contagious bovine pleuropneumonia agent with competitive ELISA in cattle sera	Contagious bovine pleuropneumonia surveillance and laboratory diagnosis	Laboratory expertise health management
Methodical guidelines for collection, storage and transportation of probang samples for FMD tests	FMD surveillance including FMD surveillance in wildlife	Laboratory expertise health management Wildlife health and biodiversity
Methodical Guidelines for detection of subtype N3 avian influenza virus RNA with real-time RT-PCR	Avian influenza surveillance and laboratory diagnosis	Laboratory expertise health management
Methodical Guidelines for indirect determination of infectivity titre of canine alphacoronavirus in vaccine production seed with reverse transcription and real-time polymerase chain reaction	Pet animal disease laboratory diagnosis	Laboratory expertise health management
Methodical Guidelines for detection of antibodies against peste des petits ruminants virus with indirect enzyme-linked immunosorbent assay in small ruminant sera	Peste des petits ruminant surveillance and laboratory diagnosis	Laboratory expertise health management
Methodical Guidelines for detection of antibodies against rabies virus with competitive enzyme-linked immunosorbent assay	Rabies surveillance and laboratory diagnosis	Laboratory expertise health management

Methodical Guidelines for detection of classical swine fever virus genome using multiplex real-time RT-PCR with internal control	Classical swine fever surveillance and laboratory diagnosis	Laboratory expertise health management
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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
IAEA Zoonotic Disease Integrated Action (ZODIAC) initiative	Austria	Europe	Strengthening of the preparedness and capabilities of Member States to rapidly detect and timely respond to outbreaks of zoonotic diseases
FMD WRL	Pirbright Institute, UK	Europe	Molecular epidemiology of FMD outbreaks Exchange of FMDV genomic sequences according to the MoU on the WOA?H/FAO FMD Reference Laboratory Network
Onderstepoort Veterinary Institute (Pretoria, RSA)	RSA	Africa	Coordination of joint research activities
OFFLU Secretariat	-	Africa Americas Asia and Pasific Europe MiddleEast	Provision of genomic sequences of H5/H7/H9 avian influenza viruses for WOA?H/FAO/WHO international network every 6 months
Bureau of Animal Husbandry and Veterinary Services, Ministry of Agriculture and Rural Affairs, PRC; Veterinary and Animal Breeding Agency, Mongolia	China Mongolia	Asia and Pasific	Interaction in case of dangerous disease emergency, including FMD. Agreement between China, Mongolia and Russia on transboundary trade and transboundary disease risk mitigation
European Commission for the Control of Foot-and-Mouth Disease (EU FMD)	Rome, Italy	Americas Asia and Pasific Europe MiddleEast	Exchange of information on disease outbreaks, animal vaccination Cooperation between Transcaucasian countries, Russia and Iran for prevention and control of FMD and other transboundary animal diseases (GF-TADs)
			Repeated exchange of HPAI and ND virus isolates

Istituto Zooprofilattico Sperimentale delle Venezie (IZSVE)	Padua, Italy	Europe	recovered on poultry farms during initial and epidemiologically significant outbreaks for comparative studies
Animal and Plant Health Agency (APHA)	Weybridge, England	Europe	Repeated exchange of HPAI and ND virus isolates recovered on poultry farms during initial and epidemiologically significant outbreaks for comparative studies
National Institute of Animal Health, National Agriculture and Food Research Organization (NIAH/NARO)	Japan	Asia and Pasific	Repeated exchange of HPAI and ND virus isolates recovered on poultry farms during initial and epidemiologically significant outbreaks for comparative studies
GD Animal Health	Netherlands	Europe	Avian diseases (international proficiency tests)

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
International Atomic Energy Agency (IAEA)	Austria	Europe	Study of the virus ecology and bird migrations through testing biological materials from wild waterfowl for avian influenza virus detection and bird species genetic identification, and for determination of stable isotope content in feathers
Intergovernmental Council for Cooperation in the Field of Veterinary Medicine	Armenia, Belarus, Kazakhstan, Kyrgyzstan, Tadjikistan, Uzbekistan	Asia and Pasific Europe	Joint measures of CIS members for prevention and control of FMD, rabies, high pathogenicity avian influenza and Newcastle disease

TOR6: EXPERT CONSULTANTS

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

No

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

The Centre provided consultation and diagnostic services in control and prevention of avian diseases in the Republic of Belarus, Republic of Kazakhstan, Republic of Uzbekistan.

- 10 biological samples submitted from the Republic of Belarus were RT-PCR tested and 4,990 samples were ELISA tested for avian influenza and ND.
- 4 biological samples submitted from the republic of Kazakhstan were RT-PCR tested and 108 samples were ELISA tested for avian influenza and ND.

The Centre is the provider of the inter-laboratory proficiency tests:

- Specificity of the FMD diagnostic tests: Name of the Test - LPB ELISA; 10 participating laboratories (ARMENIA, AZERBAIJAN, BELARUS, KAZAKHSTAN, KYRGYZSTAN, MOLDOVA, MONGOLIA, RUSSIA);
- Validation of ND diagnostic methodology: Name of the Test - Detection ND virus antibodies (ELISA test); 24 participating laboratories (RUSSIA);
- Validation of AI diagnostic methodology: Name of the Test - Detection RNA of AI virus Detection virus antibodies (ELISA test); 24 participating laboratories (RUSSIA).

The Centre provided consultations and services for bovine infectious disease control:

- Workshop 'Strategy of FMD prevention and control', National Veterinary Laboratory, Islamabad, Pakistan
- 5 biological samples submitted from Jordan were tested (ELISA, virus isolation, RT-PCR, sequencing);
- 15 biological samples submitted from the Republic of Uganda were tested (virus isolation, RT-PCR, sequencing).

Marketing of avian influenza diagnostic test-kits and vaccines:

Avian influenza vaccine

- Avian Influenza H9N2 + Newcastle Disease associated killed oil-based vaccine: Belarus, Kazakhstan, Egypt
- Avian Influenza H5N1 + Newcastle Disease associated killed oil-based vaccine: Egypt
- Avian Influenza H5N1 killed oil-based vaccine «AviFluVac»: Kazakhstan, Egypt

Diagnostic test-kits were supplied to the following countries:

- Kit for detection of avian influenza virus subtype H9 antibodies in HI test: Belarus, Kazakhstan,
- Kit for detection of avian influenza virus subtype H5 antibodies in HI test: Belarus, Kazakhstan
- Kit for detection of avian influenza virus subtype H5&H7 antibodies in HI test: Belarus
- Kit for detection of avian influenza virus antibodies in one dilution immunoassay test: Russia, Belarus

Marketing of ND diagnostic test-kits and vaccines:

- Avian Influenza H9N2 + Newcastle Disease associated killed oil-based vaccine: Belarus, Kazakhstan, Egypt
- Avian Influenza H5N1 + Newcastle Disease associated killed oil-based vaccine: Egypt

Diagnostic test-kits were supplied to the following countries:

- Kit for detection of Newcastle disease virus antibodies in HI test: Russia, Belarus, Kazakhstan
- Kit for detection of Newcastle disease virus antibodies in one dilution immunoassay test: Russia, Belarus

Marketing of FMD diagnostic test-kits and vaccines:

FMD vaccine

- Adsorbed FMD vaccine was supplied to the following countries: Kazakhstan, Morocco, Syria, Afghanistan, Pakistan, Iran, Lebanon, Armenia, Jordan, Saudi Arabia, Egypt, Kuwait, Bangladesh, Oman. United Arab Emirates
- ARRIAH-VAC emulsion FMD vaccine was supplied to the following countries: Kazakhstan, Mongolia, Republic of Korea, Pakistan

Diagnostic test-kits were supplied to the following countries:

- ELISA test-kit for detection of FMDV antibodies (LPB ELISA) – Belarus
- ELISA test-kit for detection of FMDV antigen (ELISA Ag detection) – Kyrgyzstan
- FMD-NSP-ELISA (NSP-ELISA) – Indonesia
- anti-FMDV type-specific serum (FMDV sera) – Kazakhstan

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 : 24
- b) Seminars : 224
- c) Hands-on training courses: 68
- d) Internships (>1 month) : 0

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
A	Visit of a delegation of representatives of the Veterinary Department of the Ministry of Agriculture of the Islamic Republic of Iran	Republic of Iran	3

A	Visit of the delegation of the Republic of Gambia to get familiarized with the FGBl "ARRIAH" activities	Gambia	4
A	Technical assistance on diagnosis, prevention and control of highly dangerous diseases	Republic of Korea	3
A	Visit of representatives of the National Agricultural Research Organization (NARO) on scientific cooperation and cooperation in the field of veterinary product supplies	Republic of Uganda	5
A	Veterinary surveillance system in the Russian Federation	The Republic of Iran	8
B	Epizootology, diagnosis and control of animal rabies	Republic of Belarus	1
B	Epizootology, diagnosis, prevention and control measures of FMD SAT-2	Republic of Kazakhstan Republic of Armenia Republic of Belarus Kyrgyz Republic	62
B	FMD prevention and control strategy	Pakistan	100
B	Foot-and-mouth disease virus SAT-2	Armenia, Georgia, Azerbaijan, Russia	61
C	Methods of microbiological control of food products. Validation and verification of microbiological test methods	Republic of Belarus	2
C	Physico-chemical methods for testing milk and dairy products	Republic of Belarus	3
C	Inspection of establishments for compliance with the requirements of China, Vietnam and Mongolia. Export certification of animal products	Republic of Belarus	1
C	Foot-and-mouth disease: epizootology, diagnosis, prevention and control measures	Republic of Armenia	3
C	Physico-chemical methods for testing meat and meat products	Republic of Belarus	1
C	Quantification of medicinal product residues in food, mixed feed, animal biological material using HPLC-MS/MS	Republic of Kazakhstan	3

C	Laboratory tests of feed	Republic of Belarus	1
C	Microbiological tests of meat and meat products	Republic of Belarus	3
C	Basic necropsy for different animal species	Kyrgyz Republic	5
C	Physico-chemical methods for testing milk and dairy products	Republic of Belarus	2
C	Quality control methods (physico-chemical) of feed, mixed feed, feed raw materials	Kyrgyz Republic	2
C	Determination of antibiotics in meat, honey and milk using chemiluminescent enzyme biochip-based immunoassay	Kyrgyz Republic	5
C	Physico-chemical methods of food testing	Republic of Belarus	3
C	Veterinary and sanitary assessment of food products of animal and plant origin	Kyrgyz Republic	2
C	Current zoonotic diseases	Republic of Belarus	1
C	Preparation of nutrient media. Methods and procedures for quality control of nutrient media	Kyrgyz Republic	2
C	Microbiological tests of milk and dairy products	Iran	9
C	Determination of drug residues in food products of animal origin	Iran	9
C	Mycological tests of feed and pathological material	Kyrgyz Republic	3
C	Determination of the active substance mass fraction in dry and liquid (emulsion) pesticide products	Kyrgyz Republic	3
C	Microbiological tests of milk and dairy products	Kyrgyz Republic Republic of Belarus	2

C	Foot-and-mouth disease: epizootology, diagnosis, prevention and control measures	Republic of Armenia	3
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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?H?

Yes

NATIONAL/INTERNATIONAL	TITLE OF EVENT	CO-ORGANISER	DATE (MM/YY)	LOCATION	NO. PARTICIPANTS
International	FMD Roadmap meeting for West Eurasia countries and Consultations on peste des petits ruminants (PPR) control plan for Economic Cooperation Organisation (ECO)	-	2023-04-27	Baku, Republic of Azerbaijan	40
National	PVC training	WOAH Regional Representation for Europe	2023-09-19	WOAH/FAO	57
International	International Scientific and Practical Conference "Veterinary Medicine in Food Security and Biological Safety" dedicated to the 65th anniversary of the establishment of the Federal Center for Animal Health	-	2023-12-07	Vladimir, Russia	150
International	WOAH/FAO Foot-and-Mouth Disease Reference Laboratory Network Meeting	WOAH/FAO	2023-10-12	WOAH/FAO	16

TOR9: DATA AND INFORMATION DISSEMINATION

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

a) Articles published in peer-reviewed journals:

39

1. *A guide to molecular characterization of genotype II African swine fever virus: essential and alternative genome markers: scientific publication / A. Mazloun, A. van Schalkwyk, R. Chernyshev [et al.] // Microorganisms. - 2023. - Vol. 11, No. 3. - P. 642.*
2. *Analysis of avian orthoavulavirus 1 detected in the Russian Federation between 2017 and 2021: scientific publication / N. A. Guseva, S. N. Kolosov, N. G. Zinyakov [et al.] // Vaccines. - 2023. - Vol. 11, No. 6. - P. 1032.*
3. *Analysis of foot-and-mouth disease spread with milk and dairy products: scientific publication / A. V. Mischenko, A. M. Gulyukin, M. I. Gulyukin [et al.] // Veterinariya. - 2023. - No. 1. - P. 11-15.*
4. *Analytical hierarchy process as a tool supporting a decision-making for assessment of the risk of transboundary infectious animal disease introduction to the Russian Federation and previously disease-free territories: scientific publication / N. V. Lebedev, A. S. Igolkin, K. N. Gruzdev [et al.] // Veterinary Science Today. - 2023. - V. 12, No. 1. - P. 87-96.*
5. *Anthropogenic factors of diseases and death of Atlantic salmon (Salmo salar L.): scientific publication / V. V. Vorobyev, Il. A. Chvala, F. I. Korennoy // Fisheries. - 2023. - No.3. - P. 14-24.*
6. *Biological properties of African swine fever virus ASFV/Kaliningrad 17/WB-13869: A. Shotin, A. S. Igolkin, A. Mazloun [et al.] // Sel'skokhozyaistvennaya Biologiya. - 2023. - V. 58, No. 4. - P. 773-783.*
7. *Biological properties of foot-and-mouth disease virus A 2205/G-IV strain: scientific publication / M. V. Sidorovskaya, S. N. Fomina, V. V. Nikiforov [et al.] // Veterinary Science Today. - 2023. - V. 12, No. 4. - P. 331-336.*
8. *Biological, cytomorphological and karyological heterogeneity of transformed cell lines derived from domestic pig (Sus scrofa L.) organs: scientific publication / B. L. Manin, Ye. A. Trofimova, V. L. Gavrilova, O. S. Puzankova // Veterinary Science Today. - 2023. - V. 12, No. 1. - P. 13-22.*
9. *Bovine nebovirus infection (review): scientific publication / V. A. Mischenko, A. V. Mischenko, T. B. Nikeshina [et al.] // Veterinary Science Today. - 2023. - V. 12, No. 4. - P. 278-283.*

10. Comparison of gross pathology between classical and recombinant Lumpy Skin Disease Viruses: scientific publication / I. N. Shumilova, A. Sprygin, A. Mazloum [et al.] // *Viruses*. - 2023. - Vol. 15, No. 9. - 16 p.
11. Current approaches to development of real-time qPCR test-kits: scientific publication / M. I. Doronin, D. V. Mikhailishin, A. C. Sprygin [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 3. - P. 197-207.
12. Development and application of a real-time polymerase chain reaction assay to detect lumpy skin disease virus belonging to the Kenyan sheep and goat pox group: scientific publication / A. Sprygin, A. Mazloum, A. van Schalkwyk [et al.] // *BMC research notes*. - 2023. - Vol. 16, No. 1. - 7 p.
13. Development of polymerase chain reaction kit for detection of SARS-CoV-2 RNA in biological samples collected from animals: scientific publication / A. M. Timina, A. S. Yakovleva, M. V. Timanov [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 1. - P. 45-51.
14. Epidemiological data on feline pan-leukopenia in the Russian Federation: scientific publication / A. M. Kiselev, C. V. Scherbinin, M. S. Mannova, T. S. Galkina // *Veterinary Pathology*. - 2023. - V. 22, No. 1. - P. 23-30.
15. Feline panleukopenia (review): scientific publication / A. M. Kiselev, S. V. Scherbinin, T. S. Galkina // *Veterinary Science Today*. - 2023. - V. 12, No. 4. - P. 303-307.
16. Global avian influenza situation (2019–2022). Host range expansion as evidence of high pathogenicity avian influenza virus evolution: scientific publication / M. V. Zhiltsova, T. P. Akimova, A. B. Varketin [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 4. - P. 293-302.
17. Goat-derived cell line (*Capra hircus*) TCh generated by karyological and morphological transformation of YaDK-04 CCL during subcultivation with lanthanide-treated bovine serum: scientific publication / Ye. A. Trofimova, S. V. Kononova, I. N. Shumilova, B. L. Manin // *Veterinary Science Today*. - 2023. - V. 12, No. 4. - P. 345-353.
18. Highly Pathogenic Avian Influenza A(H5N1) Virus-Induced Mass Death of Wild Birds, Caspian Sea, Russia, 2022./I.Sobolev, A. Gadzhiev, K. Sharshov, ...+V.Irza, A.M. Shestopalov. October 2023. *Emerging Infectious Diseases* 29(12), P 2528-32; DOI: 10.3201/eid2912.230330
19. History of the FGBI "ARRIAH" international cooperation on foot-and-mouth disease (on occasion on the 65th anniversary of the Institute): scientific publication / V. M. Zakharov // *Veterinary Science Today*. - 2023. - V. 12, No. 2. - P. 102-110.
20. Inactivation of foot-and-mouth disease virus for vaccine production: scientific publication / D. V. Mikhailishin, V. V. Mikhailishin, Y. M. Gochmuradov, Yu. S. Yelkina // *Veterinary Science Today*. - 2023. - V. 12, No. 2. - P. 164-170.
21. Modern approaches to production of safe and effective genetically modified rabies vaccines for animals: scientific publication / Doronin M.I., Mazloum A., Mikhailishin D.V. [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 1. - P. 6-12.
22. Molecular and biological properties of African swine fever virus isolate (asfarviridae: asfivirus) ASF/TATARSTAN 20/WB-: scientific publication / A. R. Shotin, R. S. Chernyshev, Ye. O. Morozova [et al.] // *Problems of Virology*. - 2023. - V. 68, No. 4. - P. 302-314.
23. Molecular and biological properties of the African swine fever virus (Asfarviridae: Asfivirus) isolate ASF/Tatarstan 20/WB-12276: scientific publication / A. Shotin, R. Chernyshev, Ye. Morozova [et al.] // *Problems of Virology*. - 2023. - Vol. 68, No. 4. - P.302-314.
24. Novel protocol for the preparation of porcine bone marrow primary cell culture for African swine fever virus isolation: scientific publication / O. Puzankova, V. Gavrilova, R. Chernyshev [et al.] // *Methods and Protocols*. - 2023. - Vol. 6, No. 5. - 73.
25. Post-genomic era in agriculture and veterinary science: successful and proposed application of genetic targeting technologies: scientific publication / A. Mazloum, M. Karahan, R. Chernyshev [et al.] // *Frontiers in Veterinary Science*. - 2023. - No. 10. - 1180621.
26. Properties of *Actinobacillus pleuropneumoniae* isolates: scientific publication / V. A. Yevgrafova, O. V. Pruntova, N. B. Shadrova, A. M. Timina // *Veterinary Science Today*. - 2023. - V. 12, No. 2. - P. 178-184.
27. Provision of veterinary services in livestock holdings in the Russian Federation: scientific publication / M. A. Shibayev, A. S. Oganessian, A. M. Selyanin [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 4. - P. 363-371.
28. Rabies in the Republic of Kazakhstan: spatial and temporal characteristics of disease spread over one decade (2013–2022): scientific publication / A. M. Kabzhanova, A. S. Kadyrov, A. A. Mukhanbetkaliyeva [et al.] // *Frontiers in Veterinary Science*. - 2023. - Vol. 10. - 1252265.
29. Reemergence of arctic-like rabies virus in a rabies free area in the Amur river basin / A. D. Botvinkin, E. M. Poleshchuk, S. A. Chupin [et al.] // *One Health Implement Research*. - 2023. - Vol. 3. - P125-134.
30. Seroprevalence and risk factors of peste des petits ruminants in different production systems in Uganda: scientific publication / J. Nkamwesiga, P. Lumu, D. P. Nalumenya [et al.] // *Preventive Veterinary Medicine*. - 2023. - Vol. 221. - 106051.
31. Significant factors for Pacific salmon diseases (review) / V. V. Vorobyev // *Agrarian Russia*. - 2023. - No. 5. - P. 18-25.
32. Simulating the spread of peste des petits ruminants in Kazakhstan using the North American animal disease spread model: scientific publication / K. Yessenbayev, Y. Mukhanbetkaliyev, G. Yessembekova [et al.] // *Transboundary and Emerging Diseases*. - 2023. - 7052175.
33. Spatial patterns of tuberculosis in Russia in the context of social determinants / N. Shartova, F. Korennoy, S. Makhazova // *Spatial and Spatio-temporal Epidemiology*. - 2023. - No. 45. - P. 1-12
34. Spatial patterns of tuberculosis in Russia in the context of social determinants: scientific publication / N. Shartova, F. Korennoy, S. Makhazova // *Spatial and Spatio-temporal Epidemiology*. - 2023. - Vol. 45. - 100580.
35. Spatiotemporal analysis of African swine fever spread in wild boar population in Russian Federation, 2007–2022: scientific publication / O. I. Zakharova, A. A. Blokhin, O. A. Burova [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 1. - P. 57-65.
36. Study of cultural properties of canine enteric coronavirus isolate in different cell cultures: scientific publication / A. A. Komarova, T. S. Galkina // *Veterinary Science Today*. - 2023. - V. 12, No. 1. - P. 23-28.
37. Testing and identification of bovine viral diarrhea virus isolates recovered in Russia between 2019 and 2022.: scientific publication / R. I. Bubyakina, S. V. Kononova, I. N. Shumilova [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 4. - P. 315-321.
38. Torovirus infection in animals (review): scientific publication / V. A. Mischenko, A. V. Mischenko, T. B. Nikeshina [et al.] // *Veterinary Science Today*. - 2023. - V. 12, No. 2. - P. 133-139.
39. Use of milk samples for control of cattle disease epidemics: scientific publication / A. V. Mischenko, A. M. Gulyukin, A. S. Oganessian [et al.] // *Agrarian Science*. - 2023. - No. 5. - P. 27-32.

b) International conferences:

37

1. The 2-nd seminar of Asia-Pacific countries (on-line). Organized by the WOAHA representation in Japan and Hokkaido University.
2. The 3-rd FAO/IAEA Research Coordination Meeting on Avian Influenza in Wild Avifauna, 4-5.12.23 (on-line). A report on the avian influenza situation in the Russian Federation and the ARRIAH activities within CRP D32034.
3. The 8-th International Conference "Fish. Aquaculture: Present and Future", St. Petersburg, January 31 to February 02, 2023. A report on the topic: "The global fish disease situation in 2020-2022".
4. OFFLU Pre VCM Meeting, on-line, 11.09.23.

5. The V-th International Scientific Conference "The impact of climate change on biological diversity and the spread of animal viral infections in Eurasia", report on the current avian influenza situation in the Russian Federation. Federal Research Centre for Fundamental and Translational Medicine, Novosibirsk, 5-7. 12. 2022 (on-line).
6. The VI-th International Poultry Farmers Forum of Uzbekistan, Report on avian influenza, Tashkent, 21.11.23.
7. The VI-th Russian-Chinese Symposium on Infectious Diseases, FGBI Influenza Research Institute named after A.A. Smorodintsev, Ministry of Health of the Russian Federation, report on the current avian influenza situation in the Russian Federation, November 7-8, 2023, St. Petersburg.
8. The VIII-th All-Russian GMP Conference devoted to approaches to medicinal product circulation (Yekaterinburg).
9. The X-th Kazakhstan International Poultry Farmers Forum - IVth Forum of the Eurasian Poultry Association, Astana, report on highly dangerous avian diseases (influenza and ND), 25.06 - 29.06.2023.
10. FAO Webinar, report on AI, ARRIAH, on-line, 17.05.2023.
11. Indo Livestock 2023 Expo & Forum, Republic of Indonesia, reports on the topics: "Vaccination and diagnosis of lumpy skin disease and peste des petits ruminants", "FMD vaccines and diagnostic test kits".
12. Congress with international participation "Molecular diagnostics and biosafety" (April 27-28, 2022, Moscow).
13. International exhibition "UzAgroExpo-2023" Tashkent, Republic of Uzbekistan.
14. International Annual Scientific and Practical Conference on Agriculture and Biotechnology (IACAB 2023), Samarkand (Uzbekistan) 17-18 October. "Comparative evaluation of the ARRIAH PPR vaccine effectiveness by challenging goats with the "Mongolia/2021" field isolate".
15. International Scientific Conference on the sidelines of Indo Livestock 2023 Expo & Forum 26-28.07. 2023, Surabaya, Indonesia. A report on the topic: "FMD vaccines and diagnostic test kits".
16. International Scientific and Practical Conference "Molecular Diagnostics 2023". (14.11.2023, Moscow, Russia).
17. International scientific and practical conference "Actual problems of treatment and prevention of diseases in young animals", Belarus.
18. International Scientific and Practical Conference "Biotechnology and Biosafety: achievements and prospects".
19. International scientific and practical conference "Veterinary medicine achievements and problems in the Far North of the Russian Federation".
20. International scientific and practical conference "Modern achievements in solving urgent problems of the agribusiness" (Minsk, Republic of Belarus). Topics of the reports: Immunobiological properties of FMDV isolates recovered in Mongolia and the Republic of Kazakhstan in 2021-2022; Achievements of the Russian Federation in the framework of FMD surveillance.
21. International scientific and practical conference of poultry farm veterinarians of the Russian Federation and CIS countries "Topical issues of diagnosis and prevention of poultry infectious diseases in commercial poultry farming". Report: "The current situation related to highly dangerous poultry diseases. Analysis and forecast". Vladimir, 2-3.03. 2023.
22. International Scientific and Practical Conference dedicated to the 65th anniversary of the Research Institute for Biological Safety Problems "Biotechnology and Biological Safety: achievements and prospects" September 7-8, 2023 (Almaty, Republic of Kazakhstan). Reports on the topic: "Spread of FMDV O/ME-SA/Ind-2001e sublineage in Russia, Kazakhstan, Mongolia in 2021-2022", "Study of the Seneca Valley virus within the improvement of FMD differential diagnosis".
23. International scientific and practical conference "New generation vaccines for the prevention of livestock highly dangerous diseases", Report: Molecular epizootological studies of the FMDV SAT-2 properties and vaccine development.
24. International agricultural exhibition "Agros 23". Report at the section "Animal Husbandry": "The current situation related to highly dangerous avian diseases. Import substitution"; Moscow, January 25, 2023.
25. International scientific and practical conference "Topical issues of diagnosis, prevention and treatment of cattle and pig diseases", organized by the Republican Unitary Enterprise "Institute of Experimental Veterinary Medicine named after S.N. Vyshesl'sky", Belarus (Minsk, October 27, 2023). Topics of the reports: "Clinical and post-mortem signs in sheep pox-affected animals"; "PCR and HRM for differentiation of the SPV NISKHl vaccine strain and field isolates".
26. International Seminar (FAO) on the prevention and control of foot-and-mouth disease and lumpy skin disease 03.10. 2023. Lahore, Republic of Pakistan. FMD vaccines manufactured by FGBI "ARRIAH".
27. International Seminar on Animal and Plant Health (SISA 2023), organized by the National Center for Animal and Plant Health (CENSA) in Varadero, Cuba.
28. International Symposium on LSD and ASF, Guangzhou, Guangdong Province, China.
29. International Poultry Farmers Forum. Report: "The current avian influenza situation in the world and in the Russian Federation. Vaccination in the complex of measures to control high pathogenicity avian influenza", Moscow, January 24, 2023.
30. Scientific and practical conference "Veterinary medicine in food and biological security", dedicated to the 65th anniversary of the FGBI ARRIAH.
31. Scientific and practical conference "Issues of national security" (within the framework of the XVIIth International Scientific and Practical "Baltic Forum of Veterinary Medicine and Food Security", St. Petersburg).
32. Scientific and practical seminar on genetic technologies at the University of Foshan, PRC
33. Plenary session "Russia – India: strategic partnership in the field of agriculture", 37th International Exhibition "AAHAR – International Food & Hospitality Fair 2023".
34. Fifth workshop on PPR thermostable vaccines, India;
35. Seminar "Modern methods of feeding, keeping and veterinary protection of high performance egg-laying crossbred poultry". Gulistan, Tajikistan, 29.05 – 3.06.2023. A report on avian influenza and Newcastle disease.
36. A symposium on biological safety assurance in animal husbandry, 14.12.23, Foshan University, Foshan, Guangdong Province, China.
37. OFFLU Pre VCM Meeting, on-line, 30.01.23.

c) National conferences:

4

1. Seminar "Aquaculture. Legal regulation, quality and safety problems", Sortavala, Republic of Karelia (organized by the Association of Trout Farmers of Karelia), from September 11 to 15, 2023. A report on the topic: "The global fish disease situation in 2020-2023".
2. Scientific and practical conference "Actual problems of veterinary medicine, animal science and biotechnology" within the framework of the All-Russian Science Fest (11.10.2023, Moscow, FSBEI MGAVMiB - named after K.I. Scriabin).
3. National scientific and practical conference of tutors, graduate students and students "Diagnosis, therapy and prevention of animal diseases".
4. Scientific and practical conference on the topic: "Modern means of diagnosis and prevention of infectious diseases of cattle, pigs and poultry"

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

10

1. Webinar: WOAHA Observatory, 20 March 2023;
2. WOAHA Webinar: Sustainable Diagnostic Containment Laboratories-Grand Challenges Canada, 14 March 2023.
3. WOAHA PPR Reference Laboratory Network workshop
4. Webinar of Russian Union of Poultry Producers (Rosptitzesoyuz): "Biosafety of establishments" for the employees of the poultry farms in the Russian Federation and CIS, FGBI "ARRIAH", 22 March 2023;
5. Global consultation on highly pathogenic avian influenza, FAO, 2-4 May 2023, online participation.
6. Negotiations with the Institute of Biosafety and Biotechnology Issues of the Tajikistan Academy of Agricultural Sciences
7. Participation in the 45th meeting of the CIS Intergovernmental Council for Cooperation in the Field of Veterinary Medicine (Uzbekistan, 2023).
8. Participation in the CIS Commission on Economic Issues, 28 June 2023, Russia, Moscow: Implementation of CIS common measures in 2021-2022 for FMD control and prevention up to 2025.
9. Participation in the training at ARC-ONDERSTEUPOORT VETERINARY RESEARCH (ARC-OVR), Pretoria, SAR: Technology of hybridome production and bioinformation script writing.
10. Participation in the Ninth Review Conference of the Biological Weapons Convention with the Russian delegation (Geneva). Off-line, online and hybrid conferences and workshops at the national level including webinar series for specialists of state veterinary services and poultry farms

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

Methodical guidelines

1. Methodical guidelines for detection of *Mycoplasma bovis* DNA with real-time polymerase chain reaction approved by FGBI "ARRIAH" on 22.02.2023 / 22-23, Abed Alhussen Mohammad, A. V. Sprygin, A. O. Krotova [et al.]. - Vladimir, 2023. - 27 p.
2. Methodical guidelines for determination of feline calicivirus infectivity with microtitration: approved by FGBI "ARRIAH" on 12.04.2023 / 25-23, A. M. Kiselev, T. S. Galkina, A. A. Komarova [et al.]. - Vladimir, 2023. - 20 p.
3. Methodical guidelines for determination of hemagglutinating activity of feline panleukopenia virus with micro-hemagglutination assay: approved by FGBI "ARRIAH" on 12.04.2023 / 24-23, A. A. Komarova, T. S. Galkina, A. A. Klimova, A. M. Kiselev. - Vladimir, 2023. - 20 p.
4. Methodical guidelines for determination of feline viral rhinotracheitis virus infectivity with microtitration: approved by FGBI "ARRIAH" on 12.04.2023 / 26-23, O. G. Yashina, T. S. Galkina, A. A. Komarova. - Vladimir, 2023. - 21 p.
5. Methodical guidelines for detection of swine vesicular disease virus RNA with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 12.04.2023 / 28-23, A. V. Scherbakov, A. M. Timina. - Vladimir, 2023. - 10 p.
6. Methodical guidelines for assessment of pig establishment biosecurity system for its effectiveness within the framework of contagious porcine disease introduction and spread risk audit: approved by FGBI "ARRIAH" on 12.04.2023 / 34-23, A. A. Shevtsov, A. S. Oganessian, I. A. Makarenko. - Vladimir, 2023. - 18 p.
7. Methodical guidelines for detection of type 1 feline herpesvirus DNA with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 23.06.2023 / 39-23, A. V. Scherbakov, A. M. Timina. - Vladimir, 2023. - 10 p.
8. Methodical guidelines for teschovirus RNA detection with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 23.06.2023 / 40-23, A. V. Scherbakov, A. M. Timina. - Vladimir, 2023. - 11 p.
9. Methodical guidelines for detection of fowl pox virus DNA with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 23.06.2023 / 41-23, N. P. Yelatkin, A. N. Andriyasova, Ye. V. Ovchinnikova [et al.]. - Vladimir, 2023.
10. Methodical guidelines for detection of subtype A and B avian metapneumovirus RNA with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 23.06.2023 / 42-23, Z. B. Nikonova, Ye. V. Ovchinnikova, N. G. Zinyakov [et al.]. - Vladimir, 2023. - 11 p.
11. Methodical guidelines for detection and typing of vesicular stomatitis virus with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 23.06.2023 / 43-23, A. V. Scherbakov, A. M. Timina, V. V. Nikiforov, T. K. Mayorova. - Vladimir, 2023. - 12 p.
12. Methodical guidelines for microorganism identification using MALDI-TOF autof ms 1000 mass spectrometer: approved by FGBI "ARRIAH" on 23.06.2023 / 44-23, S. V. Andreyeva, N. B. Shadrova, G. S. Skitovich. - Vladimir, 2023. - 21 p.
13. Methodical guidelines for phylogenetic analysis of field isolates and strains of feline calicivirus with reverse transcription, polymerase chain reaction and nucleotide sequencing: approved by FGBI "ARRIAH" on 23.06.2023 / 46-23, M. I. Doronin, T. S. Galkina, D. V. Mikhailishin, I. A. Chvala. - Vladimir, 2023. - 19 p.
14. Methodical guidelines for detection of antibodies against type E fowl adenovirus with single-dilution enzyme-linked immunosorbent assay in sera: approved by FGBI "ARRIAH" on 23.06.2023 / 47-23, M. A. Volkova, P. S. Yaroslavtseva, A. A. Kozlov, D. B. Andreychuk. - Vladimir, 2023. - 15 p.
15. Methodical guidelines for detection of antibodies against type D fowl adenovirus with single-dilution enzyme-linked immunosorbent assay in sera: approved by FGBI "ARRIAH" on 23.06.2023 / 48-23, M. A. Volkova, P. S. Yaroslavtseva, S. P. Lazareva, D. B. Andreychuk. - Vladimir, 2023. - 15 p.
16. Methodical guidelines for detection of antibodies against type B fowl adenovirus with single-dilution enzyme-linked immunosorbent assay in sera: approved by FGBI "ARRIAH" on 23.06.2023 / 49-23, M. A. Volkova, P. S. Yaroslavtseva, A. A. Kozlov, D. B. Andreychuk. - Vladimir, 2023. - 15 p.
17. Methodical guidelines for detection of antibodies against feline panleukopenia virus with hemagglutination inhibition assay: approved by FGBI "ARRIAH" on 17.08.2023 / 57-23, A. M. Kiselev, T. S. Galkina, A. A. Komarova, A. A. Klimova. - Vladimir, 2023. - 23 p.
18. Methodical guidelines for decontamination aimed at eliminating BVD virus and mycoplasmas in sheep pox, goat pox and LSD virus containing culture suspensions by passing on chicken embryonated egg chorioallantoic membrane: approved by FGBI "ARRIAH" on 17.08.2023 / 58-23, S. V. Kononova, I. N. Shumilova, O. A. Ryabikina [et al.]. - Vladimir, 2023. - 24 p.
19. Methodical guidelines for detection of antibodies against feline viral rhinotracheitis virus with microneutralization assay: approved by FGBI "ARRIAH" on 17.08.2023 / 59-23, O. G. Yashina, A. A. Komarova, T. S. Galkina, A. A. Klimova. - Vladimir, 2023. - 29 p.
20. Methodical guidelines for detection of antibodies against feline calicivirus with microneutralization assay: approved by FGBI "ARRIAH" on 17.08.2023 / 60-23, A. A. Komarova, T. S. Galkina, A. A. Klimova, A. M. Kiselev. - Vladimir, 2023. - 28 p.
21. Methodical guidelines for indirect determination of infectivity titre of feline viral rhinotracheitis causative agent in non-inactivated vaccine production seed using real-time polymerase chain reaction and quantitative hybridization fluorescence detection: approved by FGBI "ARRIAH" on 17.08.2023 / 61-23, M. I. Doronin, T. S. Galkina, D. V. Mikhailishin, I. A. Chvala. - Vladimir, 2023. - 51 p.
22. Methodical guidelines for indirect determination of infectivity titre of feline calicivirus in vaccine production seed with reverse transcription and real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 17.08.2023 / 62-23, M. I. Doronin, T. S. Galkina, D. V. Mikhailishin, I. A. Chvala. - Vladimir, 2023. - 48 p.
23. Methodical guidelines for indirect determination of infectivity titre of canine distemper causative agent in vaccine production seed with reverse transcription and real-

- time polymerase chain reaction: approved by FGBI "ARRIAH" on 17.08.2023 / 63-23, M. I. Doronin, T. S. Galkina, Il. A. Chvala. – Vladimir, 2023. - 49 p.
24. Methodical guidelines for indirect determination of infectivity titre of infectious canine hepatitis virus (CAV-1) in culture vaccine production seed with real-time polymerase chain reaction using quantification cycle CQ: approved by FGBI "ARRIAH" on 17.08.2023 / 64-23, M. I. Doronin, T. S. Galkina, D. V. Mikhailishin. – Vladimir, 2023. - 51 p.
25. Methodical guidelines for phylogenetic analysis of field isolates and strains of feline panleukopenia virus with polymerase chain reaction and nucleotide sequencing: approved by FGBI "ARRIAH" on 17.08.2023 / 70-23, S. A. Chupin, Ye. A. Chufarova, A. Yu. Sukharkov, T. S. Galkina. - Vladimir, 2023. - 41 p.
26. Methodical guidelines for indirect determination of infectivity titre of canine mastadenovirus in vaccine production seed with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 13.10.2023 / 75-23, M. I. Doronin, T. S. Galkina, D. V. Mikhailishin. – Vladimir, 2023. - 50 p.
27. Methodical guidelines for indirect determination of infectivity titre of canine alphacoronavirus in vaccine production seed with reverse transcription and real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 13.10.2023 / 77-23, M. I. Doronin, T. S. Galkina, Il. A. Chvala. – Vladimir, 2023. - 51 p.
28. Methodical guidelines for differentiation of CADV serotypes with real-time PCR and determination of Fiber gene fragment primary structure with nucleotide sequencing: approved by FGBI "ARRIAH" on 13.10.2023 / 78-23, L. O. Scherbakova, S. N. Kolosov, N. A. Guseva [et al.]. - Vladimir, 2023. - 32 p.
29. Methodical guidelines for differentiation of laboratory-attenuated and epidemic strains of African swine fever virus using polymerase chain reaction with electrophoretic detection: approved by FGBI "ARRIAH" on 13.10.2023 / 79-23, A. Mazloun, R. S. Chernyshev, A. R. Shotin, A. S. Igolkin. - Vladimir, 2023. - 34 p.
30. Methodical guidelines for preparation of exogenous internal control for real-time PCR during microorganism DNA detection: approved by FGBI "ARRIAH" on 13.10.2023 / 81-23, Ye. O. Morozova, A. O. Krotova, A. S. Sadchikova [et al.]. – Vladimir, 2023. - 32 p.
31. Methodical guidelines for determination of phylogenetic relationship between field isolates and strains of canine distemper virus with polymerase chain reaction and nucleotide sequencing: approved by FGBI "ARRIAH" on 13.10.2023 / 80-23, A. Mazloun, P. A. Kochetova, A. S. Sadchikova [et al.]. - Vladimir, 2023. - 39 p.
32. Methodical guidelines for indirect determination of infectivity titre of canine parvovirus enteritis causative agent in vaccine production seed with real-time polymerase chain reaction: approved by FGBI "ARRIAH" on 13.10.2023 / 76-23, M. I. Doronin, T. S. Galkina, D. V. Mikhailishin. - Vladimir, 2023. - 49 p.
33. Methodical guidelines for editing lumpy skin disease virus genome using overlap extension PCR and CRISPR-CAS9 technology: approved by FGBI "ARRIAH" on 30.11.2023 / 90-23, A. Mazloun, I. N. Shumilova, R. S. Chernyshev [et al.]. - Vladimir, 2023. - 38 p.
34. Methodical guidelines for assessment of indoor keeping poultry establishment biosecurity system for its effectiveness: approved by FGBI "ARRIAH" on 30.11.2023 / 91-23, M. S. Volkov, A. V. Varkentin, V. N. Irza [et al.]. – Vladimir, 2023. - 42 p.
35. Methodical guidelines for detection of classical swine fever virus genome using multiplex real-time RT-PCR with internal control: approved by FGBI "ARRIAH" on 30.11.2023 / 92-23, A. S. Sadchikova, A. Mazloun, R. S. Chernyshev, A. S. Igolkin. - Vladimir, 2023. - 42 p.
36. Methodical guidelines for detection of antibodies against rabies virus with competitive enzyme-linked immunosorbent assay: approved by FGBI "ARRIAH" on 30.11.2023 / 93-23, N. A. Nazarov, V. V. Kiseleva, A. Yu. Sukharkov, Ye. V. Chernyshova. - Vladimir, 2023. - 54 p.
37. Methodical guidelines for detection of African swine fever virus genome using nested PCR with electrophoretic detection: approved by FGBI "ARRIAH" on 30.11.2023 / 95-23, A. Mazloun, Ye. O. Morozova, R. S. Chernyshev [et al.]. – Vladimir, 2023. - 33 p.
38. Methodical guidelines for editing lumpy skin disease virus genome ORF 086 locus: approved by FGBI "ARRIAH" on 30.11.2023 / 98-23, A. Mazloun, I. N. Shumilova, R. S. Chernyshev [et al.]. - Vladimir, 2023. - 35 p.
39. Methodical guidelines for detection of antibodies against contagious pleuropneumonia causative agent with competitive enzyme-linked immunosorbent assay in cattle sera: approved by FGBI "ARRIAH" on 30.11.2023 / 100-23, O. Ye. Fedorova, Abed Alhussen Mohammad, Ye. A. Bukhon, O. P. Byadovskaya. – Vladimir, 2023. - 23 p.
40. Methodical guidelines for detection of antibodies against peste des petits ruminants virus with indirect enzyme-linked immunosorbent assay in small ruminant sera: approved by FGBI "ARRIAH" on 30.11.2023 / 101-23, Ye. A. Bukhon, O. Ye. Fedorova, I. N. Shumilova [et al.]. – Vladimir, 2023. - 21 p.
41. Methodical guidelines for detection of *Ornithobacterium Rhinotracheale* DNA with real-time PCR: approved by FGBI "ARRIAH" on 30.11.2023 / 102-23, L. O. Scherbakova, S. N. Kolosov, N. A. Guseva [et al.]. – Vladimir, 2023. - 22 p.
42. Methodical guidelines for detection of the DNA of *Avibacterium Paragallinarum*, the causative agent of avian infectious coryza, with real-time PCR: approved by FGBI "ARRIAH" on 30.11.2023 / 103-23, L. O. Scherbakova, S. N. Kolosov, N. A. Guseva [et al.]. – Vladimir, 2023. - 22 p.
43. Methodical guidelines for detection of subtype N3 avian influenza virus RNA with real-time RT-PCR: approved by FGBI "ARRIAH" on 30.11.2023 / 104-23, A. V. Andriyasyov, Ye. V. Ovchinnikova, P. D. Zhestkov [et al.]. – Vladimir, 2023. - 24 p.
44. Methodical guidelines for assessment of a method for detection of specific antibodies against duck virus hepatitis causative agent with indirect hemagglutination assay: approved by FGBI "ARRIAH" on 30.11.2023 / 105-23, Ye. V. Ivanova, D. A. Kozlov, M. S. Volkov, N. V. Moroz. – Vladimir, 2023. - 26 p.
45. Methodical guidelines for collection, storage and transportation of probang samples for FMD tests: approved by FGBI "ARRIAH" on 13.10.2023 / 87-23, V. V. Nikiforov, A. A. Shmelev, S. R. Kremenchugskaya [et al.] – Vladimir, 2023. - 28 p.
46. Methodical guidelines for detection of enteropathogenic *E.coli* bacteria (diarrheagenic *E.coli*) in animal feeds: approved by FGBI "ARRIAH" on 20.12.2023 / 120-23, A. A. Kremlva, Yu. A. Skomorina, D. V. Sharypova [et al.]. – Vladimir, 2023. - 59 p.

Patents for test-kits

1. Test-kit based on a liquid-phase blocking indirect sandwich-type variant of ELISA for determining the antibody titer against FMDV strain A No.2269/ARRIAH/2015, genotype A/ASIA/G-VII in sera of animals after immunization
2. Test-kit based on a liquid-phase blocking indirect sandwich-type variant of ELISA for determining the antibody titer against FMDV strain O
3. Test-kit for quantitative assessment of animal humoral immunity against FMDV type A antigen, strain No.2205/G-IV, genotype A/AFRICA/G-IV using a liquid-phase blocking indirect sandwich-type variant of ELISA
4. Test-kit for determining the antibody titer against FMDV antigen genotype A/ASIA/SEA-97 using a liquid-phase blocking indirect sandwich-type variant of ELISA

Patents for test methods

1. Method for indirect determination of the FMDV infectivity titer in non-inactivated vaccine production seed using a mathematical double differential of the crossing point data during viral DNA amplification
2. Method for rapid quantitative assessment of humoral immunity to FMDV strain O N2311/Zabaikalsky/2016, genotype O/ME-SA/Ind-2001 in animals after vaccination using a liquid-phase sandwich-type variant of ELISA
3. Method for determining the optimal reproduction time of rabies virus in Syrian baby hamster kidney cells BHK-21/SUSP/ARRIAH for manufacture of rabies vaccines using flow cytometric analysis of transformational changes in cellular DNA
4. Method for indirect determination of infectivity titer of canine mastadenovirus in vaccine production seed using real-time PCR
5. Method for indirect determination of infectivity titer of infectious feline rhinotracheitis agent (feline herpesvirus, FHV) in non-inactivated vaccine production seed using polymerase chain reaction and quantitative real-time hybridization-fluorescence assay
6. Method for indirect determination of infectivity titer of feline calicivirus in vaccine production seed using real-time PCR

7. Method for indirect determination of infectivity titer of canine alpha-coronavirus (Rich production strain) in vaccine production seed using real-time RT-PCR
8. Synthetic oligonucleotide primers and method for using the Newcastle disease virus as an internal control sample for RT-PCR to identify the rabies virus genome

Patents for strains

1. Yamal strain of avian influenza virus belonging to genus *Alphainfluenzavirus*, species *Influenza A virus of the H5N1 subtype* for manufacture of biologicals for specific prevention of avian influenza A subtype H5
2. Rich strain of canine coronavirus enteritis virus for manufacture of biologicals for the diagnosis and specific prevention of canine coronavirus enteritis
3. SA-21 strain of bacteria of *Streptococcus* genus, *Streptococcus agalactiae* species for manufacture of biologicals for specific prevention of mastitis in cows
4. Neethling-ARRIAH strain of the lumpy skin disease (LSD) virus of the genus *Capripoxvirus* for manufacture of biologicals for specific prevention of lumpy skin disease
5. SK strain of the classical swine fever virus (*Pestivirus*) for manufacture of biologicals for the specific prevention of classical swine fever
6. Fauna strain of feline calicivirus for manufacture of biologicals for the diagnosis and specific prevention of feline calicivirus
7. Unity strain of the canine mastadenovirus A of serotype 2 canine adenovirus for manufacture of biologicals for the diagnosis and specific prevention of serotype 2 canine adenovirus
8. Borz strain of porcine reproductive and respiratory syndrome virus *Betaarterivirus suis* 1 of the genus *Arterivirus* for manufacture of biologicals for specific prevention of porcine reproductive and respiratory syndrome
9. Lavr strain of *alphaherpesvirus 1* of feline infectious rhinotracheitis for manufacture of biologicals for the diagnosis and specific prevention of feline infectious rhinotracheitis
10. Sheba strain of *canine parvovirus 1* of feline panleukopenia for of biologicals for the diagnosis and specific prevention of feline panleukopenia
11. Strain O No. 2620/Orenburg/2021 of *Aphtae epizooticae FMDV*, genotype O/ME-SA/Ind-2001e for manufacture of biologicals for the diagnosis and specific prevention of foot-and-mouth disease
12. Foot-and-mouth disease virus strain *Aphtae epizooticae* for manufacture of biologicals for the diagnosis and specific prevention of foot-and-mouth disease genotype SAT-1/X
13. FMDV strain *Aphtae epizooticae* for manufacture of biologicals for the diagnosis and specific prevention of foot-and-mouth disease genotype SAT-2/VII

Patents for vaccines

1. Culture inactivated emulsion vaccine against foot-and-mouth disease genotype O/SEA/Mya-98 based on strain O No.2383/Primorskiy/2019
2. Combined vaccine against canine distemper, parvovirus and coronavirus enteritis, canine adenovirus infection
3. Culture inactivated adsorbed vaccine against foot-and-mouth disease genotype SAT-1/NWZ
4. Culture inactivated adsorbed vaccine against FMDV genotype O/ME-SA/PanAsia2ANT-10 based on strain O

12. Additional comments regarding your report: