World Organisation for Animal Health

Isabella Monne - - ITALY

WOAH Reference Laboratory Reports Activities 2024

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Avian influenza
***Address of laboratory:**	WOAH Reference Laboratory for Avian Influenza, Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe) Viale dell'Università 10 – 35020 Legnaro (PD) - Italy
***Tel:**	+39-049 808 4381
***E-mail address:**	imonne@izsvenezie.it
Website:	www.izsvenezie.it
***Name (including Title) of Head of Laboratory (Responsible Official):**	Calogero Terregino, Director of the Specialized Virology and Experimental Research Unit/Acting Director of the Research and Development Department (IZSVe)
***Name (including Title and Position) of WOAH Reference Expert:**	Isabella Monne, DVM PhD, Head of the Viral genomics and transcriptomics Laboratory, Division of Research and Innovation
***Which of the following defines your laboratory? Check all that apply:**	Governmental

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
Haemoagglutination inhibition (HI)	Yes	3011	53
C-ELISA (AI-type A)	Yes	22860	0

AGID	Yes	2	0
Direct diagnostic tests		Nationally	Internationally
Virus Isolation	Yes	21	39
RRT/RT-PCR	Yes	17543	1338
Sequencing of HA gene	Yes	149	62
WGS - Whole Genome Sequencing	Yes	62	247

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOAH Member Countries	Country of recipients
Virus antigen (inactivated)	HA, HI, AGID	12015 mL/2580 mL	449 mL	2131 mL	35	ALGERIA, AUSTRIA, BELGIUM, BENIN, BURKINA FASO, COLOMBIA, CYPRUS, CZECH REPUBLIC, DENMARK, EGYPT, FINLAND, FRANCE, GERMANY, HUNGARY, IRELAND, ITALY, LATVIA, MALI, MOLDOVA, MONGOLIA, MOZAMBIQUE, NIGERIA, PERU, POLAND, ROMANIA, SIERRA LEONE, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND, THAILAND, THE NETHERLANDS, TURKEY, UKRAINE, UNITED ARAB EMIRATES,
						ALGERIA, AUSTRIA, BELGIUM, BURKINA

Serum	HI, AGID, ELISA, SN	8735/2438 mL	1201 mL	1237 mL	32	FASO, COLOMBIA, CYPRUS, CZECH REPUBLIC, DENMARK, EGYPT, ESTONIA, FINLAND, FRANCE, IRELAND, ITALY, LUXEMBOURG, MALI, MOLDOVA, NIGERIA, NORWAY, PERU, POLAND, ROMANIA, SIERRA LEONE, SWEDEN, SWITZERLAND, THAILAND, THE NETHERLANDS, TURKEY, UKRAINE, UNITED ARAB EMIRATES, UNITED KINGDOM,
Virus antigen (inactivated)	RT-qPCR, RT-PCR	1223,5/157 mL	41 mL	116 mL	7	BELGIUM, DENMARK, FRANCE, GERMANY, ITALY, POLAND, TUNISIA,
Virus isolate (live)	Various	1609/5 mL	5 mL	0	1	ITALY,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

No

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Petrillo, M., Buttinger, G., Corbisier, P., Leoni, G., Paracchini, V., Lambrecht, B., Panzarin, V., Terregino, C., Querci, M., & Marchini, A. (2024). In silico design and preliminary evaluation of RT-PCR assays for A(H5N1) bird flu surveillance (Versione v1). Zenodo.	https://doi.org/10.5281/zenodo.11395692

SOP VIR 018 Detection of type A Avian influenza virus by real-time RT-PCR (Heine et al., 2015; Laconi et al., 2020) (Released on 08/10/24) (Validation for extension of scope to mammalian samples and dairy cattle milk samples – target H5)	https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/diagnostic-protocols/
SOP VIR 143 Detection of Eurasian H5 Avian influenza virus by real-time RT-PCR (Slomka et al., 2007) (Released on 08/10/24) (Validation for extension of scope to mammalian samples and dairy cattle milk samples - target H5)	https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/diagnostic-protocols/
SOP VIR 1004 HA and NA subtyping of Avian influenza virus by real-time RT-PCR (Hassan et al., 2022; James et al., 2018; Hoffmann et al., 2016) (Released on 08/10/24) (Validation for extension of scope to mammalian samples and dairy cattle milk samples - target H5)	https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/diagnostic-protocols/

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

No

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

Yes

Name of WOAH Member Country seeking assistance	Date	Which diagnostic test used	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
BENIN	2024-06-27	Real Time PCR RT PCR Sequencing	0	8
BULGARIA	2024-05-10	Real Time PCR RT PCR Sequencing	0	27
BURKINA FASO	2024-04-19	Real Time PCR RT PCR Sequencing	0	14
CROATIA	2024-01-30	Real Time PCR	0	9
CYPRUS	2024-02-13	Real Time PCR RT PCR Sequencing	0	1
GUINEA	2024-06-07	Real Time PCR	0	30
MALTA	2024-10-25	Real Time PCR	0	44
MOLDOVA	2024-01-24	Real Time PCR	0	19
MOLDOVA	2024-12-11	Real Time PCR	0	56

NIGERIA	2024-05-20	Real Time PCR	0	15
PORTUGAL	2024-09-03	Real Time PCR RT PCR	0	8
ROMANIA	2024-02-08	Real Time PCR	0	14
ROMANIA	2024-05-31	Real Time PCR	0	8
SLOVENIA	2024-10-28	Real Time PCR	0	23
SPAIN	2024-06-13	Real Time PCR	0	15
SPAIN	2024-09-02	Real Time PCR	0	14
THE NETHERLANDS	2024-05-24	Isolation HI	0	4
BULGARIA	2024-12-02	Real Time PCR	0	17

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

Yes

Name of the WOAH Member Country receiving a technical consultancy	Purpose	How the advice was provided
ALBANIA	Provided information on molecular methods for the detection of AI in mammals	Remote assistance (email)
AUSTRIA	Provided information on serological methods and reference material, such as sera produced experimentally by the EURL, to perform serology screening in cattle farms; Provided information on the most effective methods to inactivate or destroy the dung and manure after since the first clinical signs of a HPAI outbreak.	Remote assistance (email)
BELGIUM	The RL replied to questions about the storage of antigens and reference sera for avian influenza; offered support to the NRL to perform serological tests on cattle; provided a validation dossier in order to fulfill the criteria required for the accreditation of the cleavage site Sanger sequencing assays for avian influenza.	Remote assistance (email)
BRAZIL	Provided information on methods to perform virus isolation of AIV identified in mammals.	Remote assistance (email)
CHINA (PEOPLE'S REP. OF)	Provided the validation of SOP VIR 1003 for the Detection of Type A Influenza Virus by Real-Time RT-PCR (Nagy et al., 2021)	Remote assistance (email)
FRANCE	Supported the French laboratory to set up specific serological	Remote assistance (email)

	procedures	
HUNGARY	The Hungarian laboratory asked for advice on using duplex TaqMan-based real-time RT-PCR	Remote assistance (email)
IRELAND	Replied to questions regarding: H5N1 in cattle, in particular on preparation of milk/swabs for molecular testing; protocols SOP VIR 018, SOP VIR 144, SOP VIR143 for the diagnosis of samples for AIVs.	Remote assistance (email)
LUXEMBOURG	Provided clarifications on methods for HPAI diagnostic in cattle.	Remote assistance (email)
NIGERIA	Provided information on methods to perform microneutralization of avian influenza viruses adapted to mammals.	Remote assistance (email)
PORTUGAL	The RL provided information about the procedure to follow to prepare stool samples	Remote assistance (email)
SPAIN	Provided support to carry out tests on milk samples to detect H5N1 virus	Remote assistance (email)
UKRAINE	The RL provided information of recommended method to detect AIVs in milk samples.	Remote assistance (email)
UNITED KINGDOM	Provided information regarding HPAI diagnostic in cattle, milk testing/analytical sensitivity and storage of samples	Remote assistance (email)
BENIN BULGARIA BURKINA FASO CROATIA CYPRUS DENMARK GERMANY GUINEA HUNGARY MOLDOVA NIGERIA NORTH MACEDONIA (REP. OF) POLAND PORTUGAL ROMANIA SLOVENIA SPAIN	The RL supported the European and African NRLs in performing genetic characterization and in interpreting results	Remote assistance

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	WOAH Member Countries involved other than your country
				BENIN BURKINA

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Letter of Agreement PO 368312	2023-2025	Laboratory Services including confirmatory testing for HPAI in support of beneficiary countries	FAO - The Food and Agriculture Organization of the United Nations	FASO CAMEROON CONGO (DEM. REP. OF THE) COTE D'IVOIRE EGYPT ETHIOPIA GHANA GUINEA KAZAKHSTAN KENYA MALI MOZAMBIQUE NIGER NIGERIA SENEGAL SIERRA LEONE TANZANIA UGANDA ZAMBIA
EFSA - Working Group on Avian Influenza	for the time needed	Avian influenza surveillance	European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden; Wageningen Bioveterinary Research, Netherlands. Erasmus MC, Rotterdam, the Netherlands Anses (French Agency for Food, Environmental and Occupational Health & Safety) Ploufragan, France Friedrich-Loeffler-Institut, Germany.	FRANCE GERMANY ITALY SWEDEN THE NETHERLANDS
Working group on HPAI vaccination "WG/U/ALPHA/2018/04 - EFSA SWG avian influenza"	for the time needed	https://open.efsa.europa.eu/scientific-panel/2	FLI Friedrich- Loeffler- Institut (Germany) ; Erasmus University Medical Center (Rotterdam) ; Estonian University of Life Sciences (Estonia); INRAE Institut national de la recherche agronomique (France); ANSES: French Agency for Food, Environmental and Occupational Health & Safety (France); EMA European Medicines Agency (The Netherlands) WOAH https://open.efsa.europa.eu/working-group/300000012783073	ESTONIA FRANCE GERMANY THE NETHERLANDS
Memorandum of Understanding: Studies on general avian virology and genetics	2019-2024	Exchange of scientists and Technicians through short to medium term missions; sharing knowledge and expertise	Avian Virology and Immunology service of Sciensano (Belgium) Reference Laboratory for Avian Influenza	BELGIUM
Memorandum of Understanding: Research studies relating to zoonotic	2019-2024	Research collaborations for diagnostic and scientific purposes with reference to animal and human viral agents, including influenza	The Institute of Veterinary Science (IVS), University of Liverpool, UK	ITALY UNITED KINGDOM

viral agents including animal influenza viruses		viruses		
Memorandum of Understanding	2022-2027	Collaborative studies and implementation of projects on animal health, zoonotic diseases and food safety	The National Research Center for Tropical and Transboundary Diseases - LIBYA	LIBYA
OFFLU Vaccination Composition Meeting	for the time needed	The aim of the network is to identify animal influenza viruses with zoonotic potential, and to speed up production of human vaccines against zoonotic influenza, or pandemic viruses that have emerged from animals and that could have negatively impact on humans	Global network of expertise on animal influenza	AUSTRALIA BRAZIL CANADA CHINA (PEOPLE'S REP. OF) EGYPT GERMANY INDIA JAPAN KOREA (REP. OF) UNITED KINGDOM
OFFLU - AIM Avian Influenza Matching (WOAH-FAO)	for the time needed	OFFLU-AIM is designed to provide information on possible antigenic changes in HPAI viruses that could reduce their effectiveness	1. CSIRO Australian Centre for Disease Preparedness AUSTRALIA 2. Laboratório Federal de Defesa Agropecuária em Sao Paulo BRAZIL 3. National Avian Influenza Reference Laboratory, Animal Influenza Laboratory of the Ministry of Agriculture CHINA 4. Canadian Food Inspection AgencyNational Centre for Foreign Animal Disease CANADA 5. Reference Laboratory for Veterinary Quality Control on Poultry Production Animal Health Research Institute EGYPT 6. Friedrich Loeffler InstituteFederal Research Institute for Animal Health GERMANY 7. Hokkaido University, Research Center for Zoonosis Control JAPAN 8. Indian Council of Agricultural Research (ICAR) INDIA 9. Animal and Plant Quarantine Agency SOUTH KOREA 10. Animal and Plant Health Agency UK 11. National Veterinary Services Laboratories, USDA, APHIS USA	AUSTRALIA BRAZIL CANADA CHINA (PEOPLE'S REP. OF) EGYPT GERMANY INDIA JAPAN KOREA (REP. OF) UNITED KINGDOM
Agreement within the framework of the National Antarctic Research Program (PNRA) between IZSVe and the Antarctic Technical Unit of ENEA (National Agency for	2024	To enhance virological and serological surveillance of highly pathogenic avian influenza virus H5N in penguins and any carcasses of other birds and marine mammals found in the area	ITALY	ITALY

New Technologies, Energy and Economic Development)				
Novel test approaches to determine efficacy and potency of irradiated vaccines against avian influenza viruses	for the time needed	The action is part of a broader research project D32037 "Novel test Approaches to Determine Efficacy and Potency of Irradiated and Other Vaccines"	IAEA - Austria	AUSTRIA ITALY
KAPPA-FLU Horizon	2023-2027	Understanding the connectivity and dynamics of avian influenza	1. Friedrich-Loeffler-Institut (FLI), GERMANY 2. Department of Viroscience of the ERASMUS University Medical Center (ERASMUS MC), NETHERLANDS 3. Linnaeus University (LNU), SWEDEN 4. Istituto Zooprofilattico Sperimentale delle Venezie (IZSVE), ITALY 5. Swiss Ornithological Institute (SWISS OI), SWITZERLAND (associated partner) 6. Animal and Plant Health Agency (DEFRA-APHA), UNITED KINGDOM (associated partner) 7. Royal Veterinary College (RVC), UNITED KINGDOM (associated partner) 8. Canadian Food Inspection Agency (CFIA), CANADA (collaborating partner) 9. School of Public Health, The University of Hong Kong (HKU), HONG KONG (collaborating partner) 10. St. Jude Children's Research Hospital (ST JUDE), UNITED STATES (collaborating partner) 11. The Icelandic Food and Veterinary Authority (MAST), ICELAND (collaborating partner)	CANADA GERMANY HONG KONG ICELAND ITALY SWEDEN SWITZERLAND THE NETHERLANDS UNITED KINGDOM UNITED STATES OF AMERICA
FLU-SWITCH ICRAD	April 2023-March 2026	Identification of factors driving the emergence and spread of avian influenza viruses with zoonotic potential	1. INRAE INRAE - Ecole natioonale veterinaire de Toulous (France) 2. Friedrich-Loeffler-Institut. Institute of Molecular. Virology and Cell Biology. (Germany) 3. Utrecht Institute for Pharmaceutical Science. Chemical Biology & Drug Discovery. (Netherlands) 4. The University of Edinburgh. The Roslin Institute. (UK) 5. Animal and Plant Health Agency. Virology (UK) 6. University of Warsaw. Centre of New Technologies. (Poland) 7. Izmir Biomedicine and 8. Genome Center. Technological Research	FRANCE GERMANY ITALY POLAND THE NETHERLANDS TURKEY UNITED KINGDOM

			Program/Emerging Viral Diseases Laboratory (Turkey)	
POC4AIV ICRAD	2023-2025	Preventing zoonoses by screening Avian Influenza Virus (AIV) in wildlife birds and poultry using a novel rapid point of care system. https://www.era-learn.eu/network-information/networks/icrad/one-health-approach-to-zoonoses-research-and-innovation/preventing-zoonoses-by-screening-avian-influenza-virus-aiv-in-wildlife-birds-and-poultry-using-a-novel-rapid-point-of-care-system	1. Danish Technical University (Denmark) 2. Nicolaus Copernicus University in Toruń (Poland) 3. Institute for Food Safety, Animal Health and the Environment 'BIOR' (Latvia) 4. Estonian University of Life Sciences (Estonia) 5. IVBIO Technology Inc. (Turkey) 6. French Agency for Food, Environmental and Occupational Health & Safety (France) 7. DNA Diagnostic A/S (Denmark)	DENMARK ESTONIA FRANCE ITALY LATVIA POLAND TURKEY
Pandemic Information to support rapid Response (PAIR) (Horizon)	2024-2028	To strengthen the One Health strategy through the development of innovative point-of-care (POC) diagnostic tools and epidemiological modeling	20 partners (see https://pairproject.eu/	AUSTRIA DENMARK ESTONIA FRANCE ITALY LATVIA POLAND SPAIN TURKEY UNITED STATES OF AMERICA
The INF-ACT research program	2022-2025	Adressing unmet needs of human emerging infectious diseases in both fundamental as well as translational aspects, taking into consideration human health in a wider context, including domestic and wild animals as potential disease reservoirs and environmental factors enhancing the possibility for spillover (One Health approach).	The INF-ACT consortium is composed of 25 research Institutions from the public and the private sector	ITALY
			1. China Agricultural University, Beijing, China; 2. University of Edinburgh, Edinburgh, Scotland, UK; 3. Chinese Center for Disease Control and Prevention, Beijing; 4. The University of Hong Kong, Hong Kong, China; 5. University of Georgia, Athens, Georgia, USA; Chinese Academy of Sciences, Beijing International H9 Evolution Consortium: 1. Australian Centre for Disease Preparedness, Victoria, Australia; 2. Institut Pasteur du Cambodge, Cambodia National Influenza Center of Cambodia; 3. School of Public Health (Shenzhen), China; 4. China Agricultural University	AUSTRALIA

Proposal for a Global Classification and Nomenclature System for A/H9 Influenza Viruses	2024	https://wwwnc.cdc.gov/eid/article/30/8/23-1176_article	Beijing, China; 5. Avian Diseases Surveillance Laboratory, China Animal Health and Epidemiology Center, Qingdao, China; 6. Key Laboratory of Bio-based Material Science & Technology, Ministry of Education, Northeast Forestry University, China; 7. School of Management, Ocean University of China, Qingdao, China; 8. Songshan Lake Materials Laboratory, Songshan Lake Materials Laboratory, China; 9. Hokkaido University, Research Center for Zoonosis Control, Japan; 10. Wildlife Health Laboratory, College of Veterinary Medicine, Konkuk University, Seoul, Republic of Korea; 11. Department of Production Animal Studies, Faculty of Veterinary Science, University of Pretoria, South Africa; 12. The Pirbright Institute, Pirbright, UK; 13. Royal Veterinary College, London, UK; 14. Influenza Division, Centers for Disease Control and Prevention, Atlanta, USA; 15. Birdflu Veterinarian LLC, Watkinsville, USA.	CAMBODIA CHINA (PEOPLE'S REP. OF) JAPAN KOREA (REP. OF) SOUTH AFRICA UNITED KINGDOM UNITED STATES OF AMERICA
Highly pathogenic avian influenza A(H5N1) virus infections on fur farms connected to mass mortalities of black-headed gulls, Finland, July to October 2023	2024	https://pubmed.ncbi.nlm.nih.gov/38904109/	1. Finnish Food Authority (FFA), Helsinki, Finland. 2. Finnish Food Authority, Seinäjoki, Finland. 3. Finnish Institute for Health and Welfare (THL), Department of Health Security, Helsinki, Finland. 4. University of Helsinki, Department of Veterinary Biosciences, Helsinki, Finland. Worldwide Influenza Centre, Francis Crick Institute, London, United Kingdom	FINLAND UNITED KINGDOM
H7N6 highly pathogenic avian influenza in Mozambique, 2023	2024	https://pubmed.ncbi.nlm.nih.gov/38422451/	1. Directorate of Animal Science, Central Veterinary Laboratory, Agrarian Research Institute of Mozambique, Maputo, Mozambique. 2. Mozambique One Health Secretariat, National Health Institute, Maputo, Mozambique. 3. Ministry of Agriculture and Rural Development, National Directorate of Livestock Development, Maputo, Mozambique. 4. Emergency Centre for Transboundary Animal Diseases	AUSTRIA MOZAMBIQUE

			(ECTAD), Food and Agriculture Organization (FAO), Maputo, Mozambique. 5. Animal Production and Health Laboratory, IAEA Laboratories, Seibersdorf, Austria.	

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

No

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:

1) National surveillance programmes for avian influenza: i) National/regional surveillance programmes following the European Commission's technical advice with reference to the circulation of avian influenza viruses in domestic species; ii) Active surveillance programmes for avian influenza virus infections in wild birds and analysis of avian fecal samples from the environment, in collaboration with the Italian National Institute for Environmental Protection and Research (ISPRA); iii) National passive surveillance programmes in wild birds.
2) Epidemiologic metadata accompanied by virus genetic data from European and Western African countries.

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:

1) National Information Systems: regular reporting of epidemiological data to the Italian Ministry of Health and the EU Commission.
2) EU Commission, EFSA, and ECDC: providing technical and scientific expertise on the phenotypic and genotypic characterization of influenza viruses; contributing to the official epidemiological reports on avian influenza in Europe.
3) OFFLU VCM network: identification of animal influenza viruses with zoonotic potential; speeding up production of human vaccines against zoonotic influenza, or pandemic viruses that have emerged from animals and that could negatively impact on humans. The RL generated and provided HA sequences from 355 AI viruses of the H5, H9 and H3 subtypes selected as representative of the genetic diversity found in 2021-2022.
4) Reporting results of molecular, epidemiological and diagnostic analyses to the EU NRLs by email and/or through Mattermost, which enables and encourages safe team collaboration and enhances cooperation between veterinary/public health laboratories and scientists from the European Union (EU).
5) In November 2022 the IZSVe launched the EURL Avian Flu Data Portal, a web application where all the main official data about epidemic of HPAI in Europe are collected. Data are retrieved from ADIS – Animal Disease Information System.
In 2024 the portal was integrated with a new "Genotype Section": this section provides an update on the genotypes circulating in Europe.
https://eurlaidata.izsvenezie.it/

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

16

1. Adlhoch C., Alm E., Enkirch T., Lamb F., Melidou A., Willgert K., Marangon S., Monne I., Stegeman J.A., Delacourt R., Baldinelli F., Broglia A. (2024) Drivers for a pandemic due to avian influenza and options for One Health mitigation measures. EFSA J 22(4):e8735.
2. Alexakis L., Fusaro A., Kuiken T., Mirinavičiūtė G., Ståhl K., Staubach C., Svartström O., Terregino C., Willgert K., Delacourt R., Goudjihounde S.M., Grant M., Tampach S., Kohnle L. (2024) Avian influenza overview March-June 2024. EFSA J 22(7):e8930.
3. Cavicchio L, Campalto M, Carrino M, Lucchese L, Ceglie L, Fincato A, Boscolo Cegion L, Mazzotta E, Beato MS and Natale A (2024) Influenza in feral cat populations: insights from a study in North-East Italy.Front. Vet. Sci. 11:1439354.doi: 10.3389/fvets.2024.1439354
4. European Food Safety Authority, European Centre for Disease Prevention and Control, European Union Reference Laboratory for Avian Influenza; Alexakis L, Buczkowski H, Ducatez M, Fusaro A, Gonzales JL, Kuiken T, Ståhl K, Staubach C, Svartström O, Terregino C, Willgert K, Delacourt R, Kohnle L. Avian influenza overview June-September 2024. EFSA J. 2024 Oct 21;22(10):e9057. doi: 10.2903/j.efsa.2024.9057. PMID: 39434784; PMCID: PMC11492803.
5. Fusaro A, Pu J, Zhou Y, Lu L, Tassoni L, Lan Y, Lam TT, Song Z, Bahl J, Chen J, Gao GF, Monne I, Liu J; International H9 Evolution Consortium.(2024) Proposal for a Global Classification and Nomenclature System for A/H9 Influenza Viruses. Emerg Infect Dis. 2024 Aug;30(8):1-13. doi: 10.3201/eid3008.231176. PMID: 39043566; PMCID: PMC11286050.
6. Fusaro A., Gonzales J.L., Kuiken T., Mirinavičiūtė G., Niqueux É, Ståhl K., Staubach C., Svartström O., Terregino C., Willgert K., Baldinelli F., Delacourt R., Georganas A., Kohnle L. (2024) Avian influenza overview December 2023-March 2024. EFSA J 22(3):e8754.
7. Fusaro A., Zecchin B., Giussani E., Palumbo E., Agüero-García M., Bachofen C., Bálint Á, Banihashem F., Banyard A.C., Beerens N., Bourg M., Briand F., Bröjer C., Brown I.H., Brugger B., Byrne A.M.P., Cana A., Christodoulou V., Dirbakova Z., Fagulha T., Fouchier R.A.M., Garza-Cuartero L., Georgiades G., Gjerset B., Grasland B., Groza O., Harder T., Henriques A.M., Hjulsager C.K., Ivanova E., Janeliunas Z., Krivko L., Lemon K., Liang Y., Lika A., Malik P., McMenamy M.J., Nagy A., Nurmoja I., Onita I., Pohlmann A., Revilla-Fernández S., Sánchez-Sánchez A., Savic V., Slavec B., Smietanka K., Snoeck C.J., Steensels M., Svansson V., Swieton E., Tammiranta N., Tinak M., Borm S.V., Zohari S., Adlhoch C., Baldinelli F., Terregino C., Monne I. (2024) High pathogenic avian influenza A(H5) viruses of clade 2.3.4.4b in Europe – why trends of virus evolution are more difficult to predict. Virus Evol :veae027.
8. Graziosi G., Lupini C., Gobbo F., Zecchin B., Quaglia G., Pedrazzoli S., Lizzi G., Dosa G., Martini G., Terregino C., Catelli E. (2024) Genetic Diversity of Avian Influenza Viruses Detected in Waterbirds in Northeast Italy Using Two Different Sampling Strategies. Animals 14, no. 7: 1018. https://doi.org/10.3390/ani14071018
9. Hew YL, Hiono T, Monne I, Nabeshima K, Sakuma S, Kumagai A, Okamura S, Soda K, Ito H, Esaki M, Okuya K, Ozawa M, Yabuta T, Takakuwa H, Nguyen LB, Isoda N, Miyazawa K, Onuma M, Sakoda Y. (2024) Cocirculation of Genetically Distinct Highly Pathogenic Avian Influenza H5N5 and H5N1 Viruses in Crows, Hokkaido, Japan. Emerg Infect Dis. 2024 Aug 6;30(9). doi: 10.3201/eid3009.240356.
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b) International conferences:

7

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2. Monne, I. (2024). Epidemiology, evolution, and diagnostic aspects of influenza viruses of avian origin. Training course Respiratory viral infections: scenarios in the post SARS-CoV-2. Infezioni virali respiratorie: scenari post SARS-CoV-2, IRCCS Ospedale Sacro Cuore Don Calabria 11-12/04/2024 Verona, Italy
3. Monne, I. (2024). Influenza Aviar de Alta Patogenicidad (IAAP): Retos y el camino a seguir. XIII International Seminar AMEVEA 2024 XI EXPO - Asociación de Médicos Veterinarios del Perú, 28/05-03/06/2024 Lima, Perù
4. Monne, I. (2024). Surveillance for detection and assessment of virus evolution to inform vaccination programs including vaccine selection and updates. IABS/WOAH meeting on HPAI "Vaccination and Surveillance for HPAI in Poultry: Current Situation and Perspectives", 21-23/10/2024 Paris, France
5. Monne, I. (2024). Molecular Surveillance for Emerging Pandemic Threats. High Pathogenicity Avian influenza viruses: the only certainty is change. AMP Europe 2024 (Association for Molecular Pathology - AMP), 24-26/06/2024 Madrid, Spain
6. Monne, I. (2024). Monitoring the genetic evolution of HPAI in Europe: insights from the WOAH/FAO/EU Reference Laboratory at the IZSVe. 31st Conference of the WOAH Regional Commission for Europe. 30 September 04 October 2024 Samarkand, Uzbekistan
7. Munoz Pogoreltseva, OS. (2024) Technical Item I - The role of Animal Health and Veterinary Services in One Health and pandemic prevention and preparedness. 31st Conference of the WOAH Regional Commission for Europe. 30 September 04 October 2024 Samarkand, Uzbekistan

c) National conferences:

6

1. Crimaudo M., Marciano S., Berto P., Bofill Mas S., Rusiñol M., Bortolami A., Pascoli F., Bonfante F., Terregino C., Panzarin V. (2024). Validation of passive samplers for the detection of Avian Influenza virus in wetlands. (Poster) EAVLD 2024, 21-23/10/2024, Padova (Italy)
2. Drzewniokova, P., Bortolami, A., Bonfante, F., Bruno, F., Ramzi, S., Palumbo, E., Leopardi, S., Fusaro, A., Monne, I., De Benedictis, P., Terregino, C. (2024). Detection of avian influenza and novel coronaviruses in Italian wildlife – preliminary data. INF-ACT Meeting 2024, 11-12 September 2024, Pavia (Italy)
3. Drzewnioková, P., Brian, I., Fortin, A., Mancin, M., Gourlaouen, M., Angot, A., Niang, M., Dah, I., Berete, K., Diakite, A., Tall Lo, F., D'Amico, V., Valastro, V., De Benedictis, P., Monne, I., Panzarin, V. (2024). Validation of AIV and RABV molecular methods employing commercial freeze-dried reagents and deployment in Sub-Saharan diagnostic laboratories. EAVLD 2024, 21-23/10/2024, Padova (Italy)

4. Graziosi G.; Lupini C.; Gobbo F.; Zecchin B.; Quaglia G.; Pedrazzoli S.; Lizzi G.; Dosa G.; Martini G.; Terregino C.; Catelli E. (2024). Genetic diversity of low pathogenic avian influenza viruses In waterbirds. 8th National Congress of the Italian Society for Virology (ISV-ISV) - One Virology One Health. PO 070 - OC 15, pag. 116. 07-09/07/2024, Bologna (Italy)
5. Monne, I. (2024). High pathogenicity avian influenza (HPAI): expect the unexpected. . EAVLD 2024, 21-23/10/2024, Padova (Italy)
6. Trombetta C.M.; Marchi S.; Marotta M.G.; Bonfante F.; Maniero S.; Napolitan A.; Moreno A.; Chiapponi C.; Temperton N.; Scott S.; Daly J.; Manenti A.; Montomoli E.; Lanave G.; Camero M.; Martella V. (2024). A comprehensive investigation of exposure to influenza viruses A, B, C and D in dogs. 8th National Congress of the Italian Society for Virology (ISV-ISV) - One Virology One Health. PO 079, pag. 126. 07-09/07/2024, Bologna (Italy)

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

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Reports produced by OFFLU in collaboration with the RL experts (n°3)
1. OFFLU avian influenza matching (OFFLU-AIM) technical report (July 2024)
https://www.offlu.org/wp-content/uploads/2024/07/OFFLU-AIM-Technical-report_Final.pdf

2. OFFLU Annual Report 2023 (Published in February 2024)
https://www.offlu.org/wp-content/uploads/2024/02/OFFLU_Annual_Report_2023.pdf

3. Updated OFFLU Statement on high pathogenicity avian influenza in dairy cows
https://www.offlu.org/wp-content/uploads/2024/05/2024_05_10_HPAI_Dairy-cattle.pdf

Guidelines produced by the RL (n°1)
Guidelines and minimum requirements for diagnosis of H5N1 HPAIV infection in cattle
https://www.izsvenezie.com/documents//reference-laboratories/avian-influenza/diagnostic-protocols/guidelines-diagnosis-h5n1-cattle.pdf

Articles in international journals (n°3)
1. La gestione della pandemia nel mirino in Germania e in Italia (Terregino, podcast radio WDR, 19/04/2024)
https://www1.wdr.de/radio/cosmo/programm/sendungen/radio-colonia/il-tema/gestione-pandemia-mirino-italia-germania-100.html
2. L'autre pandémie (Monne, articolo Epsiloon 24/04/2024)
https://www.epsiloon.com/tous-les-numeros/n35/l_autre_pandemie/

3. Bird flu could become a human pandemic. How are countries preparing? (Monne, articolo Nature 12/07/2024)
https://www.nature.com/articles/d41586-024-02237-4

Genetic reports produced by the EURL and shared on the Mattermost Platform (n°3):
Reports updating the gene composition of the HPAI H5N1 viruses circulating in Europe and USA (available at the IZSVe)

Videos (n°2)
Avian Influenza: the path from panzootic to pandemic (Webinar - ISAC International Society of Antimicrobial Chemotherapy 06/12/2023)
https://www.youtube.com/watch?v=oeOULaLn73Y

Avian Influenza, Terregino: "Concern about transmission among people in USA" (Rai News 02/10/2024)
https://www.rainews.it/video/2024/10/aviaria-terregino-preoccupano-segnali-trasmissione-tra-persone-in-caso-usa-837cbba4-a75d-41c9-a4b0-aacb86229de4.html

Isabella Monne - - ITALY

Development and publication of online tools (2):
1. Development and publication of an online tool (FLUMUT) for monitoring mutations responsible for increasing the zoonotic potential of H5N1 viruses. Available here https://github.com/izsvenezie-virology/FluMut

2. Development and publication of an open-source tool (GENIN) based on neural nets to rapidly and automatically assign genotypes to clade 2.3.4.4b H5 viruses collected in Europe since October 2020, starting from complete nucleotide genome sequences. Available here https://github.com/izsvenezie-virology/genin

Invited speaker at FAO webinars (n°2 events):
1. Molecular Diagnosis of Avian Influenza 21/03/2024 (FAO)
2. Highly pathogenic avian influenza 09/05/2024 (FAO/IAEA Joint Centre)

EURL team at IZSVe (n° 5 presentations on a total of 23)
Presentations from the "29th Annual Meeting of the National Reference Laboratories for Avian Influenza and Newcastle Disease of European Union Member States" (October 2023)
https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/workshops/

Hands on training course organized (8 experts of the EURL as invited speakers)
"5-Day Workshop on Next Generation Sequencing & Data Analysis. 3rd Ed", at IZSVe, 04-08/11/2024
National Training courses organised by IZSVe (2 courses, 7 presentations on avian influenza)
1. Updates on avian influenza addressed to the diagnostic laboratories of the national surveillance network (20/12/2024)
https://www.izsvenezie.it/documenti/formazione/corsi-convegni/2024/2024-12-20-aggiornamento-crn-influenza-aviaria/programma.pdf

2. IZSVE's research Activities funded by the Ministry of Health: Projects concluded in 2023.
https://www.izsvenezie.it/documenti//formazione/corsi-convegni/2024/2024-FAD-ricerca-corrente-izsve/programma.pdf
Web pages on avian influenza from IZSVE's web site (n°7)
What are the National Reference Centers (28/11/2023)
https://www.izsvenezie.it/cosa-sono-centri-referenza-nazionali-video/

Avian influenza in cattle: what we know (15/04/2024)
https://www.izsvenezie.it/influenza-aviaria-bovini-cosa-sappiamo/

PAIR Project, New Diagnostic and Prognostic Tools to Respond to Pandemics Based on a One Health Approach
https://www.izsvenezie.it/progetto-pair/
7th EAVLD Congress – European Association of Veterinary Laboratory Diagnosticians
https://www.eavld2024.org/

Avian Influenza, specific tests for cattle and raw milk
https://www.izsvenezie.it/influenza-aviaria-studio-test-specifici-bovini-latte-crudo/

Investing in the future, the results of the first two years of INF-ACT
https://www.izsvenezie.it/investiamo-futuro-risultati-inf-act/

IZSVe at the First FAO Global Conference on Animal Health, Vaccines, and Sustainable Livestock Farming https://www.izsvenezie.it/izsve-conferenza-fao-salute-animale-vaccini-zootecnia-sostenibile/

Links accessible at the IZSVe website (n°9):
European Union Reference Laboratory (EURL) for Avian Influenza and Newcastle Disease

http://www.izsvenezie.com/reference-laboratories/avian-influenza-and-newcastle-disease/

Diagnostic protocols
https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/diagnostic-protocols/

EURL Avian Flu Data Portal
https://eurlaidata.izsvenezie.it/

WOAH & FAO activities
https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/woah-fao-activities/

Avian influenza in Europe update
https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/europe-update/

EVA-GLOBAL Biobank
https://www.izsvenezie.com/izsve-veterinary-biobank-and-the-oie-collaborating-centre-for-veterinary-biological-biobank/
https://www.european-virus-archive.com/

Integrated Services for Infectious Disease Outbreak Research (ISIDORe)
https://www.izsvenezie.it/progetto-isidore/
PAIR project, new diagnostic and prognostic tools to respond to pandemics based on a One Health approach
https://www.izsvenezie.com/pair-project/

Avian influenza, testing programs on cattle and raw milk are underway
https://www.izsvenezie.com/avian-influenza-testing-programs-cattle-raw-milk-underway/

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 10

d) Internships (>1 month) 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
C	LIBYA	2
C	BELGIUM	1
C	ROMANIA	2
C	THE NETHERLANDS	1
	ESTONIA	

C		1
C	SPAIN	1
C	FINLAND	1
C	POLAND	1

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
UNI CEI EN ISO/IEC 17025:2018	Certificate of Accreditation	17025.pdf
UNI CEI EN ISO/IEC 17043:2010	Certificate of Accreditation	17043.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Avian Influenza Viruses Antibodies agar gel immunodiffusion test	ACCREDIA – Italian Accreditation System
Avian Influenza Viruses Antibodies hemagglutination assay	ACCREDIA – Italian Accreditation System
Avian Influenza Virus Antibodies serological enzyme-linked immunosorbent assay (ELISA)	ACCREDIA – Italian Accreditation System
Avian Influenza Viruses isolation and differential diagnosis	ACCREDIA – Italian Accreditation System
Detection of type A avian influenza virus by Real-Time Reverse Transcriptase PCR	ACCREDIA – Italian Accreditation System
Avian Influenza Virus subtype H5 RT-PCR	ACCREDIA – Italian Accreditation System
Avian Influenza Virus H5 sequence analysis	ACCREDIA – Italian Accreditation System
Avian Influenza Virus subtype H7 RT-PCR	ACCREDIA – Italian Accreditation System
Avian Influenza Virus H7 sequence analysis	ACCREDIA – Italian Accreditation System
Avian Influenza Virus subtype H7 rRT-PCR	ACCREDIA – Italian Accreditation System
HA and NA subtyping of Avian influenza virus by rRT-PCR (Accredited for H5 and H7 subtypes)	ACCREDIA – Italian Accreditation System
Avian Influenza Virus subtype H9 rRT-PCR	ACCREDIA – Italian Accreditation System
Avian Influenza Virus subtype H7 rRT-PCR	ACCREDIA – Italian Accreditation System
Proficiency testing provider	ACCREDIA – Italian Accreditation System

20. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

The RL implements Biorisk management actions to prevent diseases among personnel and to protect the community from harm caused by potentially infectious pathogens. Particular attention is also paid to the safe transport management of infectious substances according to IATA guidelines and UN classification system. Agents (pathogenic or infectious organisms) posing moderate hazards to personnel and the environment are handled under BSL-2 conditions. The use of PPE, including lab coats, gloves, eye protection, and —

in some cases — face shields is mandatory. On the contrary, highly pathogenic avian influenza (HPAI) viruses are handled and cultured under BSL-3 conditions. At IZSVe, since 2013, there exists a Biosafety Committee that, together with the Biosafety Officer (BSO), is responsible for the following tasks: - Evaluation of the safety risks for workers and for the environment connected to the activities to be performed under BSL3 conditions that involves the use of microorganisms, animals and Genetically Modified Microorganisms MOGM; - Evaluation of the emergency procedures - Evaluation of all the management and operative procedures to be applied inside the BSL-3 laboratory and animal facilities including potential biosecurity issues. All Standard Operative Procedures (SOPs) and handling of pathogens are written and performed accordingly to the WHO Laboratory Biosafety Manual (4th Ed.). The BSL-3 laboratory and animal facilities are maintained regularly to ensure biocontainment during an annual suspension of activities for plant and equipment maintenance following decontamination of the premises. All the BSL-3 facilities are equipped with self-closing set of locking doors with access away from general building corridors and access is restricted and controlled at all times as part of the internal biosecurity measures.

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
WOAH–FAO VCM Influenza vaccine composition	2024-02-17	Geneva (Switzerland)	Participation in meeting as expert	//

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?

Yes

24. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
OFFLU - joint WOAH-FAO scientific network on animal influenza https://www.offlu.org/index.php/participatinglaboratories/	Participant	1	For n° of participants and WOAH ref. labs p refer to https://www.offlu.org/index.php/participating
OFFLU VCM- The aim of the network is to identify animal influenza viruses with zoonotic potential, and to speed up production of human vaccines against zoonotic influenza,	Participant	1	For n° of participants and WOAH ref. labs p refer to https://www.offlu.org/

or pandemic viruses that have emerged from animals and that could have negatively impact on humans.			
OFFLU - AIM Avian Influenza Matching (WOAH-FAO). Designed to provide information on possible antigenic changes in HPAI viruses that could reduce their effectiveness	Participant	1	For n° of participants and WOAH ref. labs p refer to https://www.fao.org/animal-heal events/events/detail/offlu-avian-influenza- (aim)-for-poultry-vaccines/en

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

Yes

Purpose of the proficiency test:	Role of your Reference Laboratory (organiser/ participant)	No. participating Laboratories	Participating WOAH Ref. Labs/ organising WOAH Ref Lab
European Proficiency Test on Avian influenza and Newcastle disease Serological, Virological and Molecular tests (2024) https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/proficiency-testing/	Organiser	Thirty-nine (39) laboratories : twenty-six (26) EU National reference Laboratories (NRLs) and twelve (13) Non-EU NRLs (including four (3) from EFTA countries)	• Friedrich Loeffler Institute, Federal Research Institute for Animal Health Institute of Diagnostic Virology (Germany); • Animal and Plant Health Agency Weybridge (UK) (detailed Information and Final coded report available at the IZSVe)
European Proficiency Test on Avian influenza and Newcastle disease Serological, Virological and Molecular tests (2023) https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/proficiency-testing/	Organiser	Forty-one (41) laboratories : twenty-six (26) EU National reference Laboratories (NRLs) and twelve (15) Non-EU NRLs (including four (4) from EFTA countries)	• Friedrich Loeffler Institute, Federal Research Institute for Animal Health Institute of Diagnostic Virology (Germany); • Animal and Plant Health Agency Weybridge (UK) (detailed Information and Final coded report • available at the IZSVe)
OFFLU Proficiency Test on Avian influenza: Molecular test (2024)	Participant	Information available from the organiser (OFFLU consortium)	Australian Centre for Disease Preparedness CSIRO 5 Portarlington Road Private Bag 24 (Ryrie Street) Geelong 3220, Victoria AUSTRALIA
OFFLU Proficiency Test on Avian influenza: Molecular test (2023)	Participant	Information available from the organiser (OFFLU consortium)	Australian Centre for Disease Preparedness CSIRO 5 Portarlington Road Private Bag 24 (Ryrie Street) Geelong 3220, Victoria AUSTRALIA;
APHA Proficiency Test on Avian influenza and Newcastle disease: Molecular, Serological and	Participant	Information available from the organiser	The Animal and Plant Health Agency (APHA)

Virological tests (2023)			Surrey, UK

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Yes

Title of the project or contract	Scope	Name(s) of relevant WOAH Reference Laboratories
OFFLU VCM Consultation on the Composition of Influenza Virus Vaccines for the Northern Hemisphere. (biannual meeting held at the WHO headquarters, Geneva –Switzerland)	Antigenic and genetic characteristics of zoonotic influenza viruses and candidate vaccine viruses developed for potential use in human vaccines Twice a year, the WHO organises consultations with an advisory group of experts to analyse influenza virus surveillance data and issue recommendations on the composition of the influenza vaccines for the following season.	1) EU Reference Laboratory, the Animal and Plant Health Agency (APHA) Surrey, UK; 2) National Avian Influenza Reference Laboratory Animal Influenza Laboratory of the Ministry of Agriculture, Harbin People's Rep. of China; 3) Hokkaido University Research Center for Zoonosis Control, Sapporo, Japan; 4) Indian Council of Agricultural Research (ICAR) National Institute of High Security Animal Diseases (NIHSAD), Bhopal, India. See also https://www.offlu.org/index.php/oie-fao-reference-laboratories-and-experts-for-highly-pathogenic-avian-influenza-and-low-pathogenic-avian-influenza-poultry/
European Food Safety Authority (EFSA) EFSA Panel on Animal Health and Welfare (AHAW) - WG on Avian Influenza	The laboratory provides technical and scientific advice to the European Commission, EFSA, and ECDC with particular reference to the genetic and phenotypic characteristics of circulating strains; contributes to EFSA's periodic reports on the epidemiological situation of Avian Influenza in Europe	Friedrich- Loeffler- Institut (FLI) (Germany) See also https://www.efsa.europa.eu/en/topics/topic/avian-influenza
OFFLU - AIM Avian Influenza Matching (WOAH-FAO)	OFFLU-AIM is designed to provide information on possible antigenic changes in HPAI viruses that could reduce their effectiveness.	1. CSIRO Australian Centre for Disease Preparedness Australia 2. Laboratório Federal de Defesa Agropecuária em Sao Paulo Brazil 3. National Avian Influenza Reference Laboratory, Animal Influenza Laboratory of the Ministry of Agriculture China 4. Canadian Food Inspection AgencyNational Centre for Foreign Animal Disease Canada 5. Reference Laboratory for Veterinary Quality Control on Poultry Production Animal Health Research Institute Egypt 6. Friedrich Loeffler InstituteFederal Research Institute for Animal Health Germany 7. Hokkaido University, Research Center for Zoonosis Control Japan 8. Indian Council of Agricultural Research (ICAR) India 9. Animal and Plant Quarantine Agency South Korea 10. Animal and Plant Health Agency UK 11. National Veterinary Services Laboratories, USDA, APHIS USA
FLU-SWITCH ICRAD	Identification of factors driving the emergence and spread of avian influenza viruses with zoonotic potential	1. Friedrich-Loeffler-Institut. Institute of Molecular. Virology and Cell Biology. (Germany) 2. Animal and Plant Health Agency. Virology (UK)
KAPPA-FLU Horizon	Understanding the connectivity and dynamics of avian influenza	1. Friedrich-Loeffler-Institut. Institute of Molecular. Virology and Cell Biology. (Germany) 2. Animal and Plant Health Agency. Virology (UK) 3. Canadian Food Inspection Agency (CFIA), Canada
Cocirculation of		

Genetically Distinct Highly Pathogenic Avian Influenza H5N5 and H5N1 Viruses in Crows, Hokkaido, Japan 2024	https://pubmed.ncbi.nlm.nih.gov/39106453/	Hokkaido University, Sapporo, Japan
Proposal for a Global Classification and Nomenclature System for A/H9 Influenza Viruses 2024	https://wwwnc.cdc.gov/eid/article/30/8/23-1176_article	International H9 Evolution Consortium (WOAH laboratories): 1. CSIRO), Australian Centre for Disease Preparedness, Geelong, Victoria 3320, Australia; 2. Virology Unit, Institut Pasteur du Cambodge, Cambodia National Influenza Center of Cambodia (Regional WHO H5 Reference Lab) ; 3. Avian Diseases Surveillance Laboratory, China Animal Health and Epidemiology Center, Qingdao, CHina (Woah RL for Newcastle disease); 4. Hokkaido University, Japan 5. The Pirbright Institute, Pirbright, UK. (several WOAH RLs) 6. Influenza Division, Centers for Disease Control and Prevention, Atlanta, GA 30329, USA.

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
National Proficiency test for "Virology, serology and molecular biology diagnosis of avian influenza and Newcastle disease" 2024	Organiser	21	AQUA IN 2024 https://www.izsvenezie.com/activities-services/interlaboratory-proficiency-testing/	ITALY,
National Proficiency test for "Virology, serology and molecular biology diagnosis of avian influenza and Newcastle disease" 2023	Organiser	20	AQUA IN 2023 https://www.izsvenezie.com/activities-services/interlaboratory-proficiency-testing/	ITALY,
International			Infomation about participants and	

Proficiency test: serological 2023	Participant	0	member countries to be provided by the organiser, The - G.D. Animal Health. https://www.gdanimalhealth.com/

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

Yes

Kind of consultancy	Location	Subject (facultative)
Vaccine Composition Meeting (OFFLU)	Geneva, Switzerland	Participation in meeting 18-23/02/2024
Vaccine Composition Meeting (OFFLU)	Melbourne, Australia	Participation in meeting 23-26/09/2024
Joint World Organisation for Animal Health (WOAH) and FAO Network of Expertise on Animal Influenza (OFFLU) global technical meeting to strengthen global preparedness for animal influenza	Rome, Italy	Invited speaker 01-04/07/2024
OFFLU Avian Influenza Matching (AIM) for Poultry Vaccines	Webinar	Participation in webinar 10/07/2024
Second Standing Group of Experts on High Pathogenicity Avian Influenza in Europe under the GF-TADs umbrella (SGE HPAI-2)	Samarkand, Uzbekistan	Invited speaker Title of the presentation: Monitoring the genetic evolution of HPAI in Europe: insights from the WOAH/FAO/EU Reference Laboratory at the IZSVe 28/09-01/10/2024
WOAH, FAO, Global Framework for Transboundary Animal Diseases (GF-TADS)	Remote assistance	Revision of the global strategy for prevention and control of HPAI (2024-2033)
31st Conference of the WOAH Regional Commission for Europe https://rr-europe.woah.org/en/the-regional-commission-for-europe-rc-europe/regional-conferences-for-europe/31st-regional-conference-for-europe/agenda-program/	Samarkand, Uzbekistan	Participation in meeting Title of the presentations: 1. Technical Item I - The role of Animal Health and Veterinary Services in One Health and pandemic prevention and preparedness ; 04/10/2024
IABS/WOAH meeting on HPAI "Vaccination and Surveillance for HPAI in Poultry: Current Situation and Perspectives"	Paris, France	Invited speaker Title of the presentation: Surveillance for detection and assessment of virus evolution to inform vaccination programs including vaccine selection and updates 21-23/10/2024
Coordinating WOAH experts in revising Chapter 3.3.4 of the WOAH Manual of Diagnostic Tests and Vaccines	Remote assistance	Avian influenza and high pathogenicity avian influenza viruses
OFFLU WOAH FAO Issued the following documents : 1) Updated OFFLU Statement on high pathogenicity avian influenza in dairy cows 2) Diagnostic guidance: HPAI dairy cattle	Remote assistance	Experts were called to conduct a review of the draft documents
Zoonotic influenza in the European region (twice a month)	Online meetings	To update Institutions on avian influenza in Europe. Data and information provided

		to WOAH and WHO

29. Additional comments regarding your report: