

# WOAH Reference Laboratory Reports Activities 2025

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## LABORATORY INFORMATION

<b>*Name of disease (or topic) for which you are a designated WOA Reference Laboratory:</b>	Avian influenza
<b>*Address of laboratory:</b>	WOAH Reference Laboratory for Avian Influenza, Istituto Zooprofilattico Sperimentale delle Venezie (IZSve) Viale dell'Università 10 – 35020 Legnaro (PD) - Italy
<b>*Tel:</b>	+39-049 808 4381
<b>*E-mail address:</b>	imonne@izsvenezie.it
<b>Website:</b>	www.izsvenezie.it
<b>*Name (including Title) of Head of Laboratory (Responsible Official):</b>	Calogero Terregino, Director of the Specialized Virology and Experimental Research Unit/Director of the Research and Development Department (IZSve)
<b>*Name (including Title and Position) of WOA Reference Expert:</b>	Isabella Monne, DVM PhD, Head of the Viral genomics and transcriptomics Laboratory, Division of Research and Innovation
<b>*Which of the following defines your laboratory? Check all that apply:</b>	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 WOA Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
<b>Indirect diagnostic tests</b>			
Haemoagglutination inhibition (HI)	Yes	2891	19
Neuraminidase inhibition	Yes	8	0
C-ELISA (AI-type A)	Yes	25151	5
AGID	Yes	18	0
<b>Direct diagnostic tests</b>			
Virus Isolation	Yes	52	77
RRT/RT-PCR	Yes	33499	2826
Sequencing of HA gene	Yes	126	34
IVPI - Intravenous Pathogenicity Index	Yes	0	0
WGS - Whole Genome Sequencing	Yes	175	547

## TOR2: REFERENCE MATERIAL

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

No

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

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOA Member Countries	Country of recipients
Virus antigen (inactivated)	HA, HI, AGID	4220 mL/4288 mL	423 mL	3865 mL	33	ALGERIA, AUSTRIA, BELGIUM, BULGARIA, BURKINA FASO, COLOMBIA, CZECH REPUBLIC, DENMARK, EGYPT, ETHIOPIA, FINLAND, FRANCE, GERMANY, GREECE, IRELAND, ISRAEL, ITALY, JORDAN, LATVIA, MALI, MOLDOVA, MOZAMBIQUE, NORWAY, POLAND, ROMANIA, SERBIA, SIERRA LEONE, SLOVENIA, SWEDEN, THE NETHERLANDS, TURKEY, UKRAINE, ZIMBABWE,
Serum	HI, AGID, ELISA, SN	1353 mL/1104 mL	195 mL	909 mL	32	ALGERIA, AUSTRIA, BELGIUM, BULGARIA, BURKINA FASO, COLOMBIA, CZECH REPUBLIC, DENMARK, EGYPT, ETHIOPIA, FINLAND, FRANCE, GREECE, IRELAND, ISRAEL, ITALY, JORDAN, LATVIA, MALI, MOLDOVA, NORWAY, POLAND, ROMANIA, SERBIA, SIERRA LEONE, SLOVENIA, SWEDEN, TURKEY, UKRAINE, UNITED ARAB EMIRATES, UNITED KINGDOM, ZIMBABWE,
Virus antigen (inactivated)	RT-qPCR, RT-PCR	59 mL/105 mL	20 mL	85 mL	11	AUSTRIA, CYPRUS, DENMARK, GERMANY, IRELAND, ITALY, JORDAN, SWITZERLAND, UKRAINE, UNITED KINGDOM,
Virus isolate (live)	Various	1608/4 mL	4 mL	0	1	ITALY,
Viral RNA	RT-qPCR, RT-PCR	0,86 mL/0,21 mL	0,06 mL	0,15 mL	2	FRANCE, ITALY,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOA Members?

## TOR3: NEW PROCEDURES

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

No

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

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Panzarin, V., Crimauo, M., Bonfante, F., Marciano, S., Berto, P., Bofill-Mas, S., Rusiñol, M., Mazzetto, E., Bortolami, A., Fornasiero, D., Martelli, L., Mulatti, P., & Terregino, C. (2025). Exploring the use of passive samplers for the surveillance of avian influenza viruses in wetlands: A laboratory and field validation study. <i>Food Environ Virol</i> 17, 37 (2025). <a href="https://doi.org/10.1007/s12560-025-09649-z">https://doi.org/10.1007/s12560-025-09649-z</a>	<a href="https://link.springer.com/article/10.1007/s12560-025-09649-z">https://link.springer.com/article/10.1007/s12560-025-09649-z</a>
SOP VIR 1000 Sample preparation and nucleic acids isolation for the detection and typing of Avian influenza virus and Avian Orthoavulavirus type 1 by molecular methods (validation of a different preparation method of milk samples for subsequent M gene and H5 testing with SOP VIR 018, 1004 and 1005)	<a href="https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/diagnostic-protocols/">https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/diagnostic-protocols/</a>
Novel (d)PCR assays for influenza A(H5Nx) viruses clade 2.3.4.4b surveillance	doi: 10.2807/1560-7917.ES.2025.30.33.2500183

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

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

## TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

Name of WOAHS 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
ALBANIA	2025-01-31	Real Time PCR	0	3
BULGARIA	2025-08-14	Real Time PCR	0	9
BULGARIA	2025-12-12	Real Time PCR	0	9
CROATIA	2025-01-08	Real Time PCR	0	20
CROATIA	2025-10-30	Real Time PCR	0	3
ESTONIA	2025-12-22	Real Time PCR	0	3
GHANA	2025-12-16	Real Time PCR	0	36
HUNGARY	2025-02-20	Real Time PCR	0	17
HUNGARY	2025-01-09	Real Time PCR	0	9
HUNGARY	2025-05-28	Real Time PCR	0	9
IRELAND	2025-06-13	Real Time PCR	0	6
IRELAND	2025-01-31	Real Time PCR	0	17
IRELAND	2025-10-29	Real Time PCR	0	10
IRELAND	2025-12-22	Real Time PCR	0	20
LIBERIA	2025-07-01	Real Time PCR	0	19
LIBYA	2025-02-21	Real Time PCR Sequencing	0	4
LITHUANIA	2025-02-13	Real Time PCR	0	12
LITHUANIA	2025-03-18	Real Time PCR	0	26
LITHUANIA	2025-08-04	Real Time PCR	0	2
LITHUANIA	2025-10-29	Real Time PCR	0	5
LITHUANIA	2025-11-04	Real Time PCR	0	5
NORTH MACEDONIA (REP. OF)	2025-08-07	Real Time PCR	0	8
MALTA	2025-01-23	HI	0	1
MALTA	2025-02-17	Elisa HI	0	1
MALTA	2025-07-11	Real Time PCR	0	50
MALTA	2025-09-23	Real Time PCR	0	30
MALTA	2025-10-08	Real Time PCR	0	15

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MALTA	2025-11-05	Real Time PCR	0	20
NIGERIA	2025-08-21	Real Time PCR	0	87
PORTUGAL	2025-02-19	Real Time PCR	0	5
PORTUGAL	2025-08-13	Real Time PCR	0	12
PORTUGAL	2025-10-30	Real Time PCR RT PCR	0	12
ROMANIA	2025-02-05	Real Time PCR	0	7
ROMANIA	2025-04-17	Real Time PCR RT PCR Sequencing	0	4
SENEGAL	2025-05-29	Real Time PCR RT PCR	0	11
SLOVENIA	2025-07-17	Real Time PCR	0	1
SPAIN	2025-07-17	Real Time PCR	0	2
SPAIN	2025-09-12	Real Time PCR RT PCR	0	23
SPAIN	2025-12-04	Real Time PCR	0	36
TOGO	2025-06-06	Real Time PCR RT PCR Sequencing	0	17
UNITED KINGDOM	2025-06-09	Real Time PCR	0	12
UNITED KINGDOM	2025-02-28	Real Time PCR	0	17
UNITED KINGDOM	2025-02-19	Real Time PCR	0	15
UNITED KINGDOM	2025-02-18	Real Time PCR RT PCR Sequencing	0	36
SLOVENIA	2025-03-18	Real Time PCR Elisa	0	19

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

Yes

Name of the WOA Member Country receiving a technical consultancy	Purpose	How the advice was provided
AZERBAIJAN	Documented the diagnostic methods available for the testing for ND and AI in vaccinated poultry (December)	Remote assistance (email)
DENMARK	Clarified the validated method for AIV testing in milk according to EURL guidelines for H5N1 HPAIV diagnosis in cattle (July)	Remote assistance (email)
FRANCE	Provided peer-reviewed sources on real-time RT-PCR for clade 2.3.4.4b H5 HPAI screening (May)	Remote assistance (email)
GREECE	Clarified diagnostic methods validated by EURL for H5 HPAI virus pathotyping; the RL responded to inquiries regarding the conservation and treatment of samples collected from mammals for AIV diagnosis (February) Supplied information on SOP VIR 125 for Eurasian H5 AIV detection by RT-PCR and Sanger sequencing of HA cleavage site. (Slomka et al., 2007) (October)	Remote assistance (email)
HUNGARY	Provided real-time PCR method to identify the NA gene (November)	Remote assistance (email)
IRELAND	Discussed about serological tests to be used for AI testing in cattle serum (March)	Remote assistance (email)
LUXEMBOURG	Replied to questions related to RNA extraction kits for AI and ND diagnostics (October) Provided guidance on rapid tests to aid in AIV pre-screening animals before entry into rescue centers. (December)	Remote assistance (email)
	Discussed the appropriate serological	

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NORWAY	HPAI (H5N1) tests in sheep and milk (May)	Remote assistance (email)
MOLDOVA	Provided guidance on SOP VIR-1004 for real-time RT-PCR-based HA and NA subtyping of AIV (May)	Remote assistance (email)
POLAND	Responded to the question regarding the diagnostic methods required for ND and AI official pathotype recognition (February)	Remote assistance (Mattermost)
PORTUGAL	Provided clarifications on RT-qPCR influenza testing in samples from exotic or uncommon species (February)	Remote assistance (email)
SENEGAL	Provided information on the real-time H5N1 duplex method (January)	Remote assistance (email)
SWEDEN	Replied to questions on the use of MinION for AIV and NDV WGS (February)	Remote assistance (email)
SWITZERLAND	Shared experience in environmental sampling. (October)	Remote assistance (email)
TURKEY	Provided technical support for the diagnosis and subtyping of AI (July)	Remote assistance (email)
UNITED KINGDOM	Supplied information on SOP VIR-1005 for molecular pathotyping and phylotyping of Eurasian H5 AIV (December)	Remote assistance (email)
BELGIUM NORWAY	Provided expert commentary on the cases of clinically healthy mallards tested positive for HPAI H5N1 (November)	Remote assistance (Mattermost)
ALBANIA AUSTRIA BELGIUM BULGARIA CROATIA CZECH REPUBLIC DENMARK ESTONIA FINLAND FRANCE GERMANY GHANA HUNGARY ICELAND IRELAND LITHUANIA LUXEMBOURG MALTA NIGERIA NORTH MACEDONIA (REP. OF) NORWAY POLAND PORTUGAL ROMANIA SENEGAL SERBIA SLOVENIA SPAIN SWEDEN SWITZERLAND TOGO UNITED KINGDOM	Supported the European and African NRLs in performing genetic characterization and in interpreting results	Diagnostics and remote assistance

## TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOA 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
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	BENIN BURKINA 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			European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden; Wageningen Bioveterinary Research, Netherlands. Erasmus MC, Rotterdam, the	FRANCE GERMANY

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Avian Influenza	(for the time needed)	Avian influenza surveillance	Netherlands Anses (French Agency for Food, Environmental and Occupational Health & Safety) Ploufragan, France Friedrich-Loeffler-Institut, Germany.	ITALY SWEDEN THE NETHERLANDS
Working group on HPAI vaccination "WG/U/ALPHA/2018/04 – EFSA SWG avian influenza"	(for the time needed)	<a href="https://open.efsa.europa.eu/scientific-panel/2">https://open.efsa.europa.eu/scientific-panel/2</a>	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 <a href="https://open.efsa.europa.eu/working-group/300000012783073">https://open.efsa.europa.eu/working-group/300000012783073</a>	ESTONIA FRANCE GERMANY THE NETHERLANDS
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 Agency National Centre for Foreign Animal Disease CANADA 5. Reference Laboratory for Veterinary Quality Control on Poultry Production Animal Health Research Institute EGYPT 6. Friedrich Loeffler Institute Federal 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 ENEA	2024–2025	To enhance virological and serological surveillance of highly pathogenic avian influenza virus H5Nx in penguins and any carcasses of other birds and marine mammals found in the area	ENEA (National Agency for New Technologies, Energy and Economic, Italy)	ITALY
IAEA Technical Contract No. 26345: "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

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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 nationale vétérinaire de Toulouse (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 Program/Emerging Viral Diseases Laboratory (Turkey)	FRANCE GERMANY ITALY POLAND THE NETHERLANDS TURKEY UNITED KINGDOM
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. <a href="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">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</a>	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 <a href="https://pairproject.eu/">https://pairproject.eu/</a> )	AUSTRIA DENMARK ESTONIA FRANCE ITALY LATVIA POLAND SPAIN TURKEY UNITED STATES OF AMERICA
The INF-ACT research program	2022–2025	Addressing unmet needs of emerging infectious diseases, considering human health in a One Health context including domestic and wild animals and environmental factors	The INF-ACT consortium is composed of 25 research Institutions from the public and the private sector	ITALY
Validation and multi-site			Food and Agriculture Organization of the United Nations, Rome, Italy Food and Agriculture Organization of the United Nations, Accra, Ghana Laboratoire National Vétérinaire de Yaoundé, Yaoundé,	

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deployment of a lyophilized qRT-PCR reagent for the molecular diagnosis of avian influenza and rabies in Sub-Saharan Africa	2025	J Clin Microbiol 0:e00080-25 — <a href="https://doi.org/10.1128/jcm.00080-25">https://doi.org/10.1128/jcm.00080-25</a>	Cameroon Laboratoire Central de Diagnostic Vétérinaire de Conakry, Conakry, Guinea Laboratoire Central Vétérinaire de Bamako, Bamako, Mali Laboratoire National d'Elevage et de Recherches Vétérinaires de Dakar, Dakar, Senegal National Veterinary Research Institute, Vom, Nigeria Laboratoire Central Vétérinaire de Lomé, Lomé, Togo	CAMEROON GHANA GUINEA MALI NIGERIA SENEGAL TOGO
Genesis and Spread of Novel Highly Pathogenic Avian Influenza A(H5N1) Clade 2.3.4.4b Virus Genotype EA-2023-DG Reassortant, Western Europe	2025	<a href="https://wwwnc.cdc.gov/eid/article/31/6/24-1870_article">https://wwwnc.cdc.gov/eid/article/31/6/24-1870_article</a>	1. Ignaz Semmelweis Institute — Austria 2. Institute of Diagnostic Virology, Friedrich Loeffler Institute — Germany 3. Institute of Virology and Immunology, Federal Department of Home Affairs — Switzerland 4. WOA International Reference Laboratory, Animal and Plant Health Agency-Weybridge — United Kingdom 5. Norwegian Veterinary Institute — Norway 6. ANSES France 7. State Veterinary Institute Department of Animal Health — Slovakia 8. Wageningen Bioveterinary Research Department of Virology — The Netherlands 9. Finnish Food Authority — Finland 10. State Veterinary Institute Prague — Czech Republic 11. Austrian Agency for Health and Food Safety, Institute for Veterinary Disease Control — Austria 12. National Veterinary Research Institute— Poland 13. Swedish Veterinary Agency— Sweden 14. SpELL, Université Libre de Bruxelles — Belgium 15. Rega Institute, KU Leuven — Belgium 16. Université Libre de Bruxelles, Vrije Universiteit Brussel — Belgium	AUSTRIA BELGIUM CZECH REPUBLIC FINLAND FRANCE GERMANY NORWAY POLAND SLOVAKIA SWEDEN SWITZERLAND THE NETHERLANDS UNITED KINGDOM
HORIZON-MSCA-2022-DN-01 — VIVACE: Management of avian influenza in a vaccination context	2024–2028	<a href="https://cordis.europa.eu/project/id/101167768">https://cordis.europa.eu/project/id/101167768</a>	1. Belgium – Sciensano 2. Belgium – Université Libre de Bruxelles 3. Egypt – Ain Shams University 4. Egypt – National Research Center de Giza 5. France – Biosellal 6. France – CEVA Santé Animale SA 7. France – Ecole nationale vétérinaire de Toulouse – ENVT 8. France – INRAE Transfert 9. France – Institut national polytechnique de Toulouse 10. Italy – Istituto Zooprofilattico Sperimentale delle Venezie 11. Italy – Università degli Studi di Siena 12. Italy – VisMederi SRL 13. Lebanon – Human Link 14. Morocco – Institut agronomique et vétérinaire Hassan II de Rabat 15. The Netherlands – Erasmus Universitair Medisch Centrum Rotterdam 16. The Netherlands – Stichting Wageningen Research 17. The Netherlands – Universiteit Utrecht 18. The Netherlands – Wageningen University 19. UK – University of Liverpool	BELGIUM EGYPT FRANCE ITALY LEBANON MOROCCO THE NETHERLANDS UNITED KINGDOM
FAO – IZSVE Letter of Agreement PO 377056	2025-2026	Laboratory Services on AI and ND, including training, proficiency testing, support of regional networks, provision of expertise, confirmatory diagnosis in support of beneficiary countries	FAO - The Food and Agriculture Organization of the United Nations	BURKINA FASO ETHIOPIA GHANA KAZAKHSTAN SIERRA LEONE TANZANIA ZAMBIA

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

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 conducted in accordance with the European Commission's legislation, with particular reference to the circulation of avian influenza viruses in domestic species; ii) Active surveillance of avian influenza virus infections in wild birds, including environmental sampling and analysis of avian fecal material, carried out in collaboration with the Italian National Institute for Environmental Protection and Research (ISPRA); iii) National passive surveillance programmes in wild birds.
- 2) Epidemiologic metadata linked to viral 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: focused on identifying animal influenza viruses with zoonotic potential; accelerating the development of human vaccines against zoonotic or pandemic influenza viruses originating from animals. The RL generated and provided HA gene sequences from 25 H5 subtype viruses selected as representative of the genetic diversity encountered during 2024–2025. Additionally, cross-antigenicity testing was performed on 43 H5 viral isolates using ferret antisera derived from candidate vaccine strains. .
- 4) Reported molecular, epidemiological, and diagnostic results to EU NRLs via email and Mattermost, facilitating secure team collaboration and strengthening cooperation among veterinary and public health laboratories across the EU. 5) In November 2022 the IZSve launched the EURL Avian Flu Data Portal, a web application consolidating official data on HPAI outbreaks in Europe, sourced from ADIS (Animal Disease Information System). In 2024 the portal was enhanced with a new "Genotype Section", providing updates on circulating genotypes across 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:

21

1. Buttinger G, Petrillo M, Valastro V, Marciano S, Crimando M, D'Amico V, Leoni G, Seigneuric R, Paracchini V, Robouch P, Lambrecht B, Gawlik BM, Terregino C, Veneri C, La Rosa G, Suffredini E, Querci M, Panzarin V, Marchini A. (2025) Novel (d)PCR assays for influenza A(H5Nx) viruses clade 2.3.4.4b surveillance. *Euro Surveill.* 2025 Aug;30(33). doi: 10.2807/1560-7917.ES.2025.30.33.2500183. PMID: 40843521.
2. Dimaki, M., Quyen, T. L., Panzarin, V., Cretaio, E., Woźniakowski, G., Šteingolde, Ž., Bērziņš, A., Viltrop, A., Kurt, A., Grasland, B., Martenot, C., Petersen, A., Wolff, A., and Svendsen, W. E. (2025). POC4AIV: Preventing Zoonoses by Screening Avian Influenza Virus in Wildlife Birds and Poultry Using a Novel Rapid Point-of-Care System. *International Coordination of Research on Infectious Animal Diseases (ICRAD) Second Call. GMPC TOP. 5 (1)*. pp.12. <https://doi.org/10.51585/gtop.2025.1.0038>
3. Drzewnioková P, Brian I, Mancin M, Fortin A, Gourlaouen M, Angot A, Niang M, Dah I, Berete K, Diakite A, Lo FT, Meseko C, Go-Maró E, D'Amico V, Valastro V, Soumare B, De Benedictis P, Monne I, Panzarin V. (2025) Validation and multi-site deployment of a lyophilized qRT-PCR reagent for the molecular diagnosis of avian influenza and rabies in Sub-Saharan African regions. *J Clin Microbiol* 0:e00080-25. <https://doi.org/10.1128/jcm.00080-25>
4. EFSA AHAW Panel (EFSA Panel on Animal Health and Welfare), Alvarez J, Boklund, A. E., Dippel, S., Dórea, F., Figuerola, J., Herskin, M. S., Michel, V., Miranda Chueca, M. Á., Nannoni, E., Nielsen, S. S., Nonno, R., Riber, A. B., Stegeman, J. A., Ståhl, K., Thulke, H.-H., Tuytens, F., Winckler, C., Bortolami, A., Ducatez, M., Guinat, C., Abdelwhab, E. M., Guillier, L., Nauta, M., Papademas, P., Suffredini, E., Messens, W., Broglia, A., Jensen, H., Kryemadhi, K. Gervelmeyer, A. (2025). Risk of infection of dairy cattle in the EU with highly pathogenic avian influenza virus affecting dairy cows in the United States of America (H5N1, Eurasian lineage goose/Guangdong clade 2.3.4.4b. genotype B3.13). *EFSA Journal*, 23(12), e9801. <https://doi.org/10.2903/j.efsa.2025.9801>
5. EFSA Panel on Animal Health and Animal Welfare (AHAW); ECDC; Alvarez J, Boklund A, Dippel S, Dórea F, Figuerola J, Herskin MS, Michel V, Miranda Chueca MÁ,

- Nannoni E, Nielsen SS, Nonno R, Riber AB, Stegeman JA, Ståhl K, Thulke HH, Tuytens F, Winckler C, Brugerolles C, Wolff T, Parys A, Lindh E, Latorre-Margalef N, Rameix Welti MA, Dürrwald R, Trebbien R, Van der Werf S, Gisslén M, Monne I, Fusaro A, Guinat C, Bortolami A, Alexakis L, Enkirch T, Svartstrom O, Willgert K, Baldinelli F, Preite L, Grant M, Broglia A, Melidou A. (2025) Preparedness, prevention and control related to zoonotic avian influenza. *EFSA J.* 2025 Jan 29;23(1):e9191. doi: 10.2903/j.efsa.2025.9191. PMID: 39882189; PMCID: PMC11775931.
6. European Food Safety Authority (EFSA); Alvarez J, Bortolami A, Ducatez M, Guinat C, Stegeman JA, Broglia A, Jensen H, Kryemadhi K, Gervelmeyer A. (2025) Risk posed by the HPAI virus H5N1, Eurasian lineage goose/Guangdong clade 2.3.4.4b. genotype B3.13, currently circulating in the US. *EFSA J.* 2025 Jul 3;23(7):e9508. doi: 10.2903/j.efsa.2025.9508. PMID: 40611987; PMCID: PMC12223544.
7. 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 J L, Kuiken T, Mirinavičiūtė G, Ståhl K, Staubach C, Svartström O, Terregino C, Willgert K, Melo M, Kohnle L. (2025) Avian influenza overview June–September 2025. *EFSA Journal.* <https://doi.org/10.2903/j.efsa.2025.9702>
8. 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, Melo M, Kohnle L. (2025) Avian influenza overview September–December 2024. *EFSA J.* 2025 Jan 10;23(1):e9204. doi: 10.2903/j.efsa.2025.9204. PMID: 39802641; PMCID: PMC11719707.
9. 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, Mirinavičiūtė G, Ståhl K, Staubach C, Svartström O, Terregino C, Willgert K, Melo M, Kohnle L. (2025) Avian influenza overview March–June 2025. *EFSA J.* 2025 Jul 23;23(7):e9520. doi: 10.2903/j.efsa.2025.9520. PMID: 40703963; PMCID: PMC12284602.
10. 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, Melo M, Kohnle L. (2025) Avian influenza overview December 2024–March 2025. *EFSA J.* 2025 Apr 15;23(4):e9352. doi: 10.2903/j.efsa.2025.9352. PMID: 40236376; PMCID: PMC11997622.
11. European Food Safety Authority; European Union Reference Laboratory for Avian Influenza; Ducatez M, Fusaro A, Gonzales JL, Kuiken T, Ståhl K, Staubach C, Terregino C, Kohnle L. Unprecedented high level of highly pathogenic avian influenza in wild birds in Europe during the 2025 autumn migration. *EFSA J.* 2025 Nov 26;23(11):e9811. doi: 10.2903/j.efsa.2025.9811. PMID: 41311369; PMCID: PMC12648623.
12. Fosse JH, Rømo G, Bonfante F, Myhrvold IK, Soetart KS, Udjus K, Tønnessen R. (2025) Detection of Antibodies Specific to H5 Avian Influenza Virus in a Sheep in Norway, June 2024, 11 Months After an Outbreak of Highly Pathogenic Avian Influenza in a Nearby Seabird Colony. *Influenza Other Respir Viruses.* 2025 Nov;19(11):e70182. doi: 10.1111/irv.70182. PMID: 41254898; PMCID: PMC12626899.
13. Giussani E, Sartori A, Salomoni A, Cavicchio L, de Battisti C, Pastori A, Varotto M, Zecchin B, Hughes J, Monne I, Fusaro A. (2025) FluMut: a tool for mutation surveillance in highly pathogenic H5N1 genomes. *Virus Evol.* 2025 Mar 7;11(1):veaf011. doi: 10.1093/ve/veaf011. PMID: 40093844; PMCID: PMC11908534.
14. Krammer F, Barclay W S, Beer M, Brown I H, Cox R J, de Jong M D, Fodor E, Fouchier R A M, Gabriel G, García-Sastre A, Guimar R, Horby P, Koopmans M, Lewis N S, Maggi S, Monne I, Naffakh N, Nohynek H, Osterhaus A, Proscenc K, Prymula R, Rappuoli R, Redlberger-Fritz M, Rimmelzwaan G F, Russell C A, Saelens X, Schwemmler M, Smith D J, Stertz S, Tähtinen P A, Terregino C, & Thålin C. (2025). Europe needs a sustainably funded influenza research and response network. *The Lancet Infectious Diseases*, 25(4), 369–372. [https://doi.org/10.1016/S1473-3099\(25\)00068-4](https://doi.org/10.1016/S1473-3099(25)00068-4)
15. Mariacher A, Di Nicola MR, Senese M, Mariottini F, Maestrini M, Bellagamba F, Donnini C, Capecci A, Salomoni A, Varotto M, Terregino C, Cersini A, Scicluna MT. Detection of avian influenza virus in the alien invasive African sacred ibis (*Threskiornis aethiopicus*) in Italy. *Front Vet Sci.* 2025 Sep 8;12:1661089. doi: 10.3389/fvets.2025.1661089. PMID: 40989950; PMCID: PMC12450672.
16. Napolitano A, Mazzacan E, Fonti N, Tomasoni S, Melchiotti E, Zanardello C, Vianello L, Ramzi S, Panzarin V, Crimauddo M, Verin R, Bonfante F, & Mazzetto E. (2025). Cryopreservation of chicken and duck tracheal rings and precision-cut lung slices: A promising tool for the rapid characterization of avian influenza viruses. *Journal of Virological Methods*, 315, 115257. <https://doi.org/10.1016/j.jviromet.2025.115257>
17. Pacini M I, Ceccherelli R, Terregino C, Bortolami A, & Silva L. (2025). The highly pathogenic avian influenza epidemic 2021–2022 from the point of view of an Italian network of Wildlife Rescue Centres. *Bird Study*, 1–12. <https://doi.org/10.1080/00063657.2025.2452309>
18. Panzarin V, Crimauddo M, Bonfante F, Marciano S, Berto P, Bofill-Mas S, Rusiñol M, Mazzetto E, Bortolami A, Fornasiero D, Martelli L, Mulatti P, & Terregino C. (2025). Exploring the use of passive samplers for the surveillance of avian influenza viruses in wetlands: A laboratory and field validation study. *Food Environ Virol* 17, 37 (2025). <https://doi.org/10.1007/s12560-025-09649-z>
19. Pouget B, Lang J, Pineada A, P de Vries P, Fusaro A, Monne I, Lee H-M, Digard P, James J, Banyard A.C., Slomka M.J, Sikorski P.J, Kavalci Z, Nitin M, Koçer Z.A., Abdelwhab A.M., Volmer R, (2025). FLU-SWITCH: Identification of factors driving the emergence and spread of avian influenza viruses with zoonotic potential. *International Coordination of Research on Infectious Animal Diseases (ICRAD) Second Call. GMPC TOP 5 (1)*. pp. 8-9. <https://doi.org/10.51585/gtop.2025.1.0038>
20. Sajjadi NC, Abolnik C, Baldinelli F, Brown I, Cameron A, de Wit S, Dhingra M, Espeisse O, Guerrin JL, Harder T, Ho J, Chua TH, Hussein K, Lyons N, Monne I, Okamuro Y, Pacheco DT, Pavade G, Poncon N, Prajitno TY, Rojas JG, Swayne D, Stegeman A. (2025) Vaccination and surveillance for high pathogenicity avian influenza in poultry—current situation and perspectives. *Biologicals.* 2025 May 12;91:101840. doi: 10.1016/j.biologicals.2025.101840. Epub ahead of print. PMID: 40359590.
21. Van Borm S, Ahrens AK, Bachofen C, Banyard AC, Bøe CA, Briand FX, Dirbakova Z, Engelsma M, Fusaro A, Gemeraad E, Gjerset B, Grasland B, Harders F, Hostyn P, Kauppinen A, Lambrecht B, Mollett BC, Monne I, Nagy A, Pohlmann A, Polzer D, Reid SM, Revilla-Fernandez S, Steensels M, Stätter M, Swieton E, Tammiranta N, Wylter M, Zecchin B, Zohari S, Dellicour S. (2025) Genesis and Spread of Novel Highly Pathogenic Avian Influenza A(H5N1) Clade 2.3.4.4b Virus Genotype EA-2023-DG Reassortant, Western Europe. *Emerg Infect Dis.* 2025 May 5;31(6). doi: 10.3201/eid3106.241870. Epub ahead of print. PMID: 40323677.

b) International conferences:

17

1. Bortolami A.; Zamboni I.; Boscolo L.; D'Anna A.; Vianello L.; Fornasiero D.; Mulatti P.; Terregino C.; Bonfante F. (2025). A Novel Peptide-Based ELISA for Differential Detection of H5 HPAI Antibodies in Poultry and Wild Birds. *XXIII World Veterinary Poultry Association Congress (WVPAC 2025) Kuching, Sarawak, Malaysia. 6-10 October 2025*
2. Bonomini A., Marciano S., Cretaio E., Crimauddo M., Terregino C., & Panzarin V. (2025). Development of a molecular toolbox to detect and pathotype Eurasian H7 avian influenza viruses. *Poster Section, pag. 163. SVV2025 – 13th International Congress for Veterinary Virology, Portorož, Slovenia, 2–5 September 2025.*

3. Castelli, A., Corsa, M., Pezzoni, G., Lelli, D., Trogu, T., Tolini, C., Bonfante, F., Terregino, C., & Moreno, A. (2025). Development and validation of a multispecies double-antigen ELISA for the detection of anti-H5 HPAIV (clade 2.3.4.4b) antibodies in human and mammalian sera. Poster Section, pag. 186. SVV2025 – 13th International Congress for Veterinary Virology, Portorož, Slovenia, 2–5 September 2025.
4. Cretaio, E., Martenot, C., Orosco, A., Marciano, S., Bonfante, F., Vianello, L., Ramzi, S., Dimaki, M., Quyen, T. L., Svendsen, W. E., Grasland, B., & Panzarin, V. (2025). Development of a novel RT-LAMP based point-of-care system (fPOC) for the detection of avian influenza virus. Poster Section, pag. 190. SVV2025 – 13th International Congress for Veterinary Virology, Portorož, Slovenia, 2–5 September 2025.
5. Fusaro, A., Cavicchio, L., Dianati, M., Giussani, E., Salomoni, A., Sartori, A., Savegnago, E., Tassoni, L., Zecchin, B., Bortolami, A., & Monne, I. (2025). Genomic insights into the broadening host range of clade 2.3.4.4b H5 avian influenza viruses. Book of Abstracts of the 10th ESWI Influenza Conference (oral presentation pag. 94), Valencia, Spain, 20–23 October 2025.
6. Monne, I. (2025) Genetic Evolution of HPAI Viruses in Europe: Insights from the 2024–2025 Epidemiological Year. 1st GF-TADs Regional Conference in the European region, 22–25 August 2025, Belgrade, Serbia [https://ir-europe.woah.org/app/uploads/2025/10/Isabella-Monne\\_IZSVe\\_SGE-HPAI-3.pdf](https://ir-europe.woah.org/app/uploads/2025/10/Isabella-Monne_IZSVe_SGE-HPAI-3.pdf)
7. Monne, I. (2025). Avian influenza: from panzootic to pandemic? Conference “Viral Emergencies: The New Challenges”, Accademia dei Lincei, 15–16/05/2025, Roma, Italy (invited speaker) <https://www.lincci.it/it/manifestazioni/emergenze-virali-le-nuove-sfide>
8. Monne, I. (2025). HPAI in Europe: an evolving threat in a complex ecosystem. 21st International Symposium of the World Association of Veterinary Laboratory Diagnosticians (ISWAVLD), 12–14/06/2025, Calgary, AB, Canada (invited speaker)
9. Monne, I. (2025). Virus classification, structure and viral life cycle. VIVACE Network-Wide Training Event, 13–15/11/2025, Rabat, Morocco (invited speaker)
10. Moreno, A., Pongolini, S., Meriadi, G., Cattoli, G., Terregino, C., Santini, N., Benedetti, S., Loli Piccolomini, L., Padovani, A., Rosamilia, A., Alborali, G., & Daminelli, P. (2025). Influenza A virus inactivation in raw milk grana type cheeses. Short Lectures, pag. 67. ESVV2025 – 13th International Congress for Veterinary Virology, Portorož, Slovenia, 2–5 September 2025.
11. Ramzi, S., Drzewniokova, P., Mazzacan, E., Facco, D., Terregino, C., & Bonfante, F. (2025). Zoonotic avian influenza H5N1 surveillance in wild carnivores in a ONE-HEALTH APPROACH. Book of Abstracts: INF-ACT Conference 2025 One Health Basic and Translational Actions Addressing Unmet Needs on Emerging Infectious Diseases - “A Step Ahead” Napoli, 3–5 April 2025 (P217, pag. 163)
12. Sartori, A., Giussani, E., Salomoni, A., Cavicchio, L., De Battisti, C., Pastori, A., Varotto, M., Zecchin, B., Huges, J., Monne, I., & Fusaro, A. (2025). FluMut: A bioinformatics tool for the surveillance of key mutations in influenza genomes. Book of Abstracts: INF-ACT Conference 2025 One Health Basic and Translational Actions Addressing Unmet Needs on Emerging Infectious Diseases - “A Step Ahead” Napoli, 3–5 April 2025 (P266 pag. 195)
13. Sartori, A., Giussani, E., Salomoni, A., Cavicchio, L., De Battisti, C., Varotto, M., Zecchin, B., Dianati, M., Zamperin, G., Hughes, J., Monne, I., & Fusaro, A. (2025). Bioinformatics tools for efficient genomic analyses of H5N1 viruses. Book of Abstracts of the 10th ESWI Influenza Conference. (Poster 486, pagina 313). Valencia, Spain, 20–23 October 2025.
14. Savegnago, E., Cavicchio, L., Salomoni, A., Dianati, M., Giussani, E., Sartori, A., Zamperin, G., Ormelli, S., Palumbo, E., Schivo, A., Salviato, A., Varotto, M., Fornasiero, D., Scolamacchia, F., Mulatti, P., Bortolami, A., Terregino, C., Monne, I., & Fusaro, A. (2025). Racking the origin, evolution and spatial spread of the Italian highly pathogenic avian influenza H5N1 viruses, 2024-2025. Book of Abstracts: INF-ACT Conference 2025 One Health Basic and Translational Actions Addressing Unmet Needs on Emerging Infectious Diseases - “A Step Ahead” Napoli, 3–5 April 2025, pag. 28.
15. Savegnago, E., Cavicchio, L., Salomoni, A., Dianati, M., Giussani, E., Sartori, A., Zamperin, G., Ormelli, S., Palumbo, E., Schivo, A., Salviato, A., Varotto, M., Fornasiero, D., Scolamacchia, F., Mulatti, P., Bortolami, A., Terregino, C., Monne, I., & Fusaro, A. (2025). The 2024–2025 highly pathogenic avian influenza H5N1 epidemic in Italy: origin, evolution and spatial spread. Book of Abstracts of the 10th ESWI Influenza Conference. Valencia, Spain, 20–23 October 2025.
16. Than Linh Quyen, Dimaki, M., Huynh, V. N., Wolff, A., Panzarin, V., & Svendsen, W. E. (2025). Fluorescence point-of-care device for rapid detection of Avian Influenza Viruses (AIV) in poultry and wild birds. Biosensors 2025, Lisbon, Portugal 19–22 May
17. Than Linh Quyen, Martenot, C., Svendsen, W. E., Cretaio, E., Panzarin, V., Grasland, B., & Dimaki, M. (2025). Development and validation of a novel point of care system for the rapid detection of avian influenza virus. 11th International Symposium on Avian Influenza, St. John's, NL, Canada 24–26 June

c) National conferences:

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1. Bortolami, A. (2025). Avian influenza beyond birds: Cross-species transmission and implications (p. 34). In Proceedings of the TURIN 2025 Annual ESVP-ECVP Congress, 27–30 August 2025, Torino, Italy
2. Domingo, M., Bortolami, A. (2025). Diagnostic approach to new infectious challenge (p. 23). In Proceedings of the TURIN 2025 Annual ESVP-ECVP Congress 27–30 August 2025, Torino, Italy
3. Martelli, L., Crimardo, M., Marciano, S., Panzarin, V., Scolamacchia, F., Faustini, G., Manca, G., Bortolami, A., Terregino, C., Mazzucato, M., De Conti, G., Tata, A., Zacometti, C., Montarsi, F., Mulatti, P., & Fornasiero, D. (2025). Environmental sampling protocol for HPAI contamination and spread: Preliminary insights from the 2024 H5N1 outbreak in Veneto, Italy. Book of Abstracts: INF-ACT Conference 2025 One Health Basic and Translational Actions Addressing Unmet Needs on Emerging Infectious Diseases - “A Step Ahead”, Napoli 3–5 April 2025 (P256 Pag. 188)
4. Panzarin, V., Veneri, C., Marciano, S., Crimardo, M., Mulatti, P., Mancini, P., Brandtner, D., Bonanno Ferraro, G., Iaconelli, M., Lucentini, L., Terregino, C., Suffredini, E., & La Rosa, G. (2025). Retrospective analysis of HPAI H5 in urban wastewater during the avian influenza epidemics in the Veneto region, Italy (2021–2024). SIV 2025 – 9th National Congress of the Italian Society for Virology: One Virology One Health, Centro Congressi Lingotto, 22–24 June 2025 Turin, Italy (PO 146 Pag 149).

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°4)

1. OFFLU avian data package for Zoonotic influenza VCM (September 2024 to February 2025)

<https://www.offlu.org/wp-content/uploads/2025/03/OFFLU-vcm-swine-2025a-Final.pdf>

2. OFFLU Avian Influenza Data Package WHO VCM September 2025

<https://offlu.org/technical-activities/september-2025-avian-influenza/>

3. OFFLU Avian Influenza Matching (OFFLU-AIM) report (September 2025)

<https://offlu.org/technical-activities/offlu-aim-technical-report-september-2025/>

4. OFFLU Annual Report 2024 (Published in April 2025)

[https://www.offlu.org/wp-content/uploads/2025/04/OFFLU\\_Annual\\_Report\\_2024\\_final.pdf](https://www.offlu.org/wp-content/uploads/2025/04/OFFLU_Annual_Report_2024_final.pdf)

Communication in international media (n°2)

1. Nouvelles du monde - "Aviaria, chercheurs italiens en Antarctique à la chasse au virus entre les pingouins"

<https://www.nouvelles-du-monde.com/aviaria-chercheurs-italiens-en-antarctique-a-la-chasse-au-virus-entre-les-pingouins/>

2. Breaking the spread of avian flu: new tools for faster detection (The Joint Research Centre: EU Science Hub of the European Commission (22/08/2025)

[https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/breaking-spread-avian-flu-new-tools-faster-detection-2025-08-22\\_en](https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/breaking-spread-avian-flu-new-tools-faster-detection-2025-08-22_en)

Genetic report produced by the EURL and shared on the Mattermost Platform (n°1):

• Designation of EA-2024-DI.2.1 to the new HPAI H5N1 subcluster within the EA-2024-DI.2 (available at the IZSve Mattermost Platform)

Online IZSve tools updating (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. A new version of Genin, Genin2, has been released and is available at <https://github.com/izsvenezie-virology/genin2>, 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

EURL team at IZSve (n° 6 presentations on a total of 20)

Presentations from the "31st Annual Meeting of the National Reference Laboratories for Avian Influenza and Newcastle Disease of European Union Member States – 2025" (16-17/10/2025 Treviso, Italy)

<https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/workshops/>

International Training courses (3):

1. Monne, I. (2025). Evolution and Genetic Diversity. VIVACE Network-Wide Training Event, 13–15/11/2025, Rabat, Morocco (invited speaker)

2. Monne, I. (2025). From LPAI to HPAI: understanding virus pathogenicity. VIVACE Network-Wide Training Event, 13–15/11/2025, Rabat, Morocco (invited speaker)

3. Monne, I. (2025). Understanding avian influenza: what it is and why it matters? Session "Essentials of avian influenza viruses", in the frame of the VIVACE Project, 13–15/11/2025, Rabat, Morocco (invited speaker)

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 (19/12/2025)

<https://www.izsvenezie.it/webinar-aggiornamenti-influenza-aviaria-malattia-newcastle/>

2. IZSve's research Activities funded by the Ministry of Health: Projects concluded in 2023 (25/06/2024 - 24/06/2025)

<https://www.izsvenezie.it/documenti/formazione/corsi-convegni/2024/2024-FAD-ricerca-corrente-izsve/programma.pdf>

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/>

## Isabella Monne - - ITALY

EVA-AISBL (EVA-GLOBAL Biobank)

The European Virus Archive becomes an international association (EVA-AISBL). IZSve among the partners

<https://www.izsvenezie.com/european-virus-archive-international-association/>

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 WOA Members?

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 17

d) Internships (>1 month) 2

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	ALGERIA	1
C	ITALY	2
C	MOROCCO	10
C	SWEDEN	2
C	UNITED KINGDOM	2
D	ITALY	1
D	SERBIA	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	Accreditation certificate 17025	17025.pdf
UNI CEI EN ISO/IEC 17043:2010	Accreditation certificate 17043	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

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Avian Influenza Virus H7 sequence analysis	ACCREDIA – Italian Accreditation System
Avian Influenza virus subtype H5 rRT-PCR	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
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 measures to prevent disease among personnel and safeguard the community from potentially infectious pathogens. Special emphasis is placed on the safe transport of infectious substances in accordance with IATA guidelines and the UN classification system. Agents (pathogenic or infectious organisms, including Newcastle disease viruses) posing moderate hazards to personnel and the environment are handled under BSL-2 conditions. Since 2013, IZSve has maintained a Biosafety Committee, with the Head of the RL as a permanent member, responsible for: 1. Assessing safety risks for personnel and the environment associated with BSL-3 activities involving microorganisms, animals, and Genetically Modified Microorganisms (GMOs); 2. Evaluating emergency procedures; 3. Reviewing all management and operational procedures within BSL-3 laboratories and animal facilities, including potential biosecurity concerns. All Standard Operative Procedures (SOPs) and handling of pathogens are pathogen handling are conducted in accordance with the WHO Laboratory Biosafety Manual (4th Ed.). BSL-3 laboratory and animal facility operations follow the WHO Laboratory Biosafety Manual (4th Ed.). Biocontainment is ensured through regular maintenance, annual activity suspension for equipment and premises decontamination, and strict access control via self-closing, lockable doors positioned away from general corridors, as part of internal biosecurity protocols

## TOR9: SCIENTIFIC MEETINGS

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

No

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

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
WOAH-BioPrevail Biological Preparedness and Resilience through Evolution and Innovation of Laboratories initiative supported by WOAHP and the Governments of Canada and the United Kingdom	2025-06-11	Calgary, AB, Canada	Challenges of avian influenza diagnostics in low resource settings – potential solutions	

## TOR10: NETWORK WITH WOAHP REFERENCE LABORATORIES

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

Yes

24. Are you a member of a network of WOAHP Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAHP REF. LABS
OFFLU - joint WOAHP-FAO scientific network on animal influenza <a href="https://www.offlu.org/index.php/participatinglaboratories/">https://www.offlu.org/index.php/participatinglaboratories/</a>	Participant	1	For n° of participants and WOAHP ref. labs participants, refer to <a href="https://www.offlu.org/index.php/participatinglaboratories/">https://www.offlu.org/index.php/participatinglaboratories/</a>
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, or pandemic viruses that have emerged from animals and that	Participant	1	For n° of participants and WOAHP ref. labs participants, refer to <a href="https://www.offlu.org/">https://www.offlu.org/</a>

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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 WOA ref. labs participants, refer to <a href="https://www.fao.org/animal-health/news-events/events/detail/offlu-avian-influenza-matching-(aim)-for-poultry-vaccines/en">https://www.fao.org/animal-health/news-events/events/detail/offlu-avian-influenza-matching-(aim)-for-poultry-vaccines/en</a>

25. Did you organise or participate in inter-laboratory proficiency tests with WOA 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 WOA Ref. Labs/ organising WOA Ref Lab
European Proficiency Test on Avian influenza and Newcastle disease Serological, Virological and Molecular tests (2025) <a href="https://www.izsvenezie.com/reference-laboratories/avianinfluenza-newcastle-disease/proficiency-testing/">https://www.izsvenezie.com/reference-laboratories/avianinfluenza-newcastle-disease/proficiency-testing/</a>	Organiser	Forty (40) laboratories : twenty-six (26) EU National reference Laboratories (NRLs) and twelve (14) Non-EU NRLs (including four (4) from EFTA countries)	<ul style="list-style-type: none"> <li>Friedrich Loeffler Institute, Federal Research Institute for Animal Health Institute of Diagnostic Virology (Germany);</li> <li>Animal and Plant Health Agency Weybridge (UK)</li> </ul> • (detailed Information and Final coded report available at the IZSve)
European Proficiency Test on Avian influenza and Newcastle disease Serological, Virological and Molecular tests (2024) <a href="https://www.izsvenezie.com/reference-laboratories/avianinfluenza-newcastle-disease/proficiency-testing">https://www.izsvenezie.com/reference-laboratories/avianinfluenza-newcastle-disease/proficiency-testing</a>	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)	<ul style="list-style-type: none"> <li>Friedrich Loeffler Institute, Federal Research Institute for Animal Health Institute of Diagnostic Virology (Germany);</li> <li>Animal and Plant Health Agency Weybridge (UK)</li> </ul> (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 Portarlinton Road Private Bag 24 (Ryrie Street) Geelong 3220, Victoria AUSTRALIA
OFFLU Proficiency Test on Avian influenza: Molecular test (2025)	Participant	Information available from the organiser (OFFLU consortium)	Australian Centre for Disease Preparedness CSIRO 5 Portarlinton Road Private Bag 24 (Ryrie Street) Geelong 3220, Victoria AUSTRALIA
APHA Proficiency Test on Avian influenza and Newcastle disease: Molecular, Serological and Virological tests (2025)	Participant	Information available from the organiser	The Animal and Plant Health Agency (APHA) Surrey, UK

26. Did your laboratory collaborate with other WOA 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 Lab
Scientific collaboration on avian influenza. Memorandum of Understanding (MOU)	Collaboration in studies/projects and common scientific initiatives on avian influenza pathogenicity and eco-epidemiology; Exchange of scientists and students through short to long-term missions	Hokkaido University R Control,
Scientific collaboration on avian influenza	EFSA Active wild birds surveillance, The SENTINEL Wild Birds project <a href="https://sentinelwildbirds.lnu.se/#:~:text=The%20European%20Food%20Safety%20Authority's,as%20well%20as%20in%20mammals.">https://sentinelwildbirds.lnu.se/#:~:text=The%20European%20Food%20Safety%20Authority's,as%20well%20as%20in%20mammals.</a>	Agence nationale l'alimentation, de l'e (ANSES) – France Fric G
OFFLU VCM		1) EU Reference Labo



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biology diagnosis of avian influenza and Newcastle disease” 2025	Organiser	24	<a href="https://www.izsvenezie.com/activities-services/interlaboratory-proficiency-testing/">https://www.izsvenezie.com/activities-services/interlaboratory-proficiency-testing/</a>	ITALY,
National Proficiency test for “Virology, serology and molecular biology diagnosis of avian influenza and Newcastle disease”	Organiser	21	AQUA IN 2024 <a href="https://www.izsvenezie.com/activities-services/interlaboratory-proficiency-testing/">https://www.izsvenezie.com/activities-services/interlaboratory-proficiency-testing/</a>	ITALY,

## TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
WOAH Case definition for HPAI notification in cattle. <a href="https://www.woah.org/app/uploads/2025/03/202503-case-definiton-hpai-cattle.pdf">https://www.woah.org/app/uploads/2025/03/202503-case-definiton-hpai-cattle.pdf</a>	Remote assistance	Participation as expert. (march 2025)
WHO Information Meeting on the Composition of Influenza Virus Vaccines for Use in the 2025-2026 Northern Hemisphere Influenza Season)	London, UK	Participation in meeting 24-27/02/2025
WHO Consultation on the Composition of Influenza Virus Vaccines for Use in the 2026 Southern Hemisphere Influenza Season	Sapporo, Japan	Participation in meeting 22-25/09/2025
OFFLU (WOAH-FAO Expertise on Animal Influenza) Meeting	St. John's, Canada	Two experts participated as invited speakers 23/06/2025
1st GF-TADs Regional Conference on priority transboundary animal diseases for Europe <a href="https://rr-europe.woah.org/en/Events/1st-gf-tads-regional-conference-of-standing-groups-of-experts-on-priority-transboundary-animal-diseases-in-the-european-region/">https://rr-europe.woah.org/en/Events/1st-gf-tads-regional-conference-of-standing-groups-of-experts-on-priority-transboundary-animal-diseases-in-the-european-region/</a>	Belgrad, Serbia	Participation in meeting 22-23/09/2025
WOAH Accelerating the Operationalisation of the One Health Joint Plan of Action (OHJPA) in Veterinary Services in the European Region <a href="https://rr-europe.woah.org/app/uploads/2025/11/Agenda_WOAH-Regional-workshop_OH_Athens_18-20-Nov-2025-002.pdf">https://rr-europe.woah.org/app/uploads/2025/11/Agenda_WOAH-Regional-workshop_OH_Athens_18-20-Nov-2025-002.pdf</a>	Athen, Greece	Participation in meeting as invited speaker
WOAH and EU Project Capacity building of veterinary and plant health services in the Western Balkans	Remote assistance	Revision of the questionnaire on HPAI «Scalable Data Entry & Reporting Platform»

29. Additional comments regarding your report: