



Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture



Animal Production and Health Section

Joint FAO / IAEA Centre

Activities on African Swine Fever

Ivancho NALETOSKI

Animal Production and Health Section

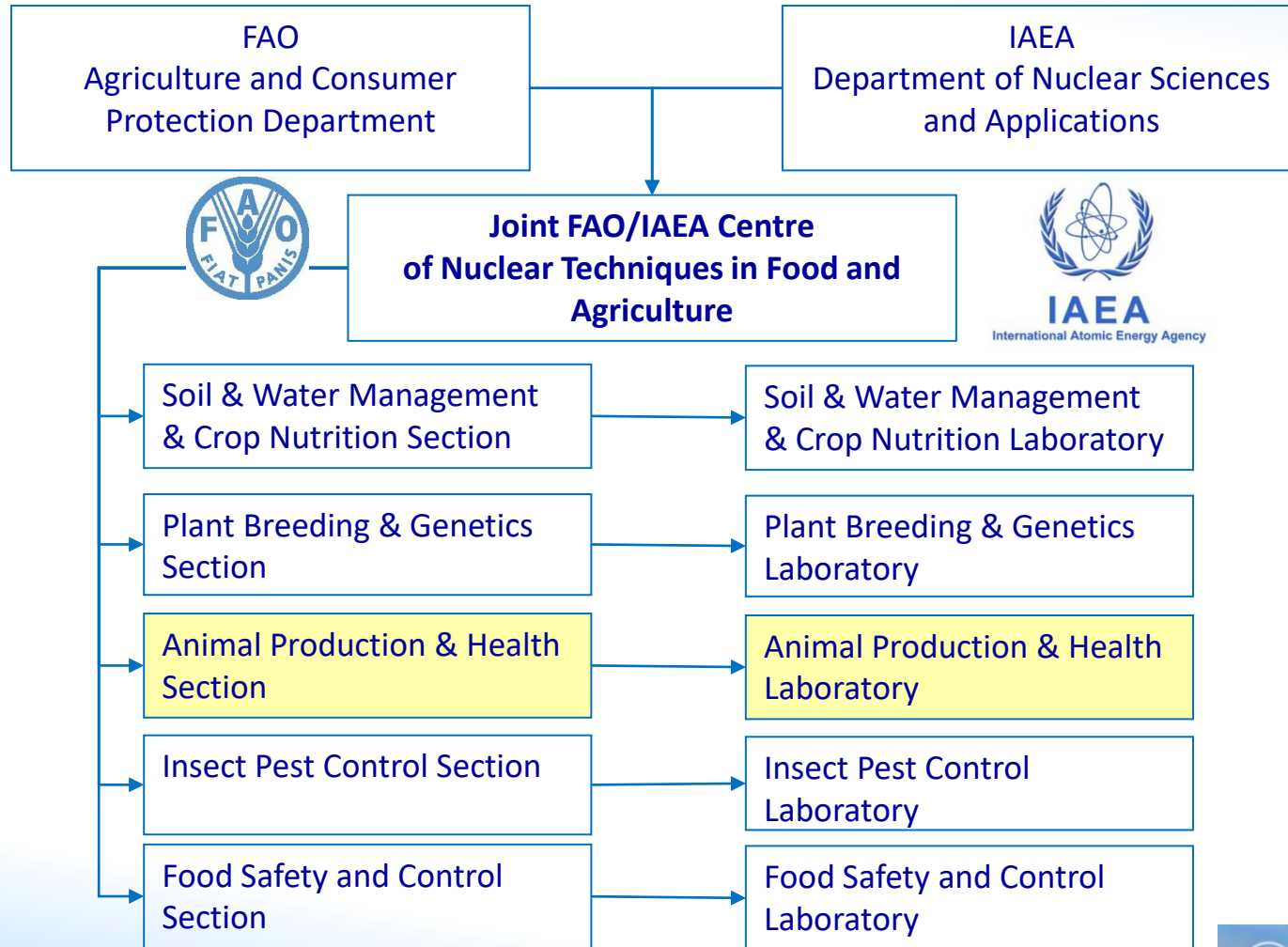
Joint FAO-IAEA Centre

Nuclear Applications and Development Department

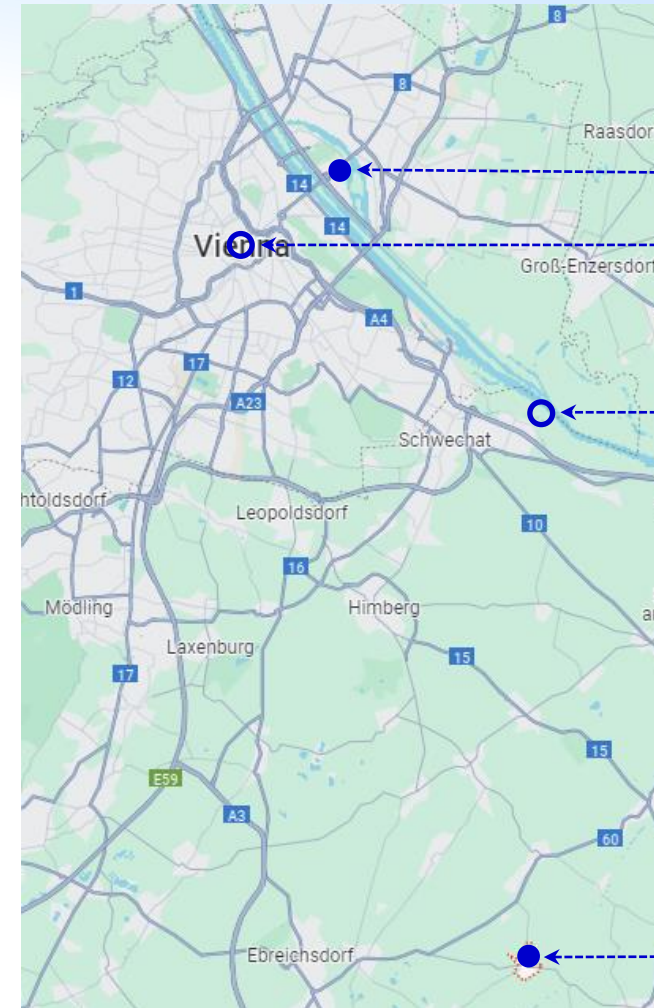
International Atomic Agency, Vienna, Austria

i.naletoski@iaea.org

Joint FAO / IAEA Centre Animal Production and Health Section



Established 1964



IAEA HQ

Vienna centre

Vienna airport

Seibersdorf



Modalities of Cooperation

TC Projects (TCs)

Building capacities

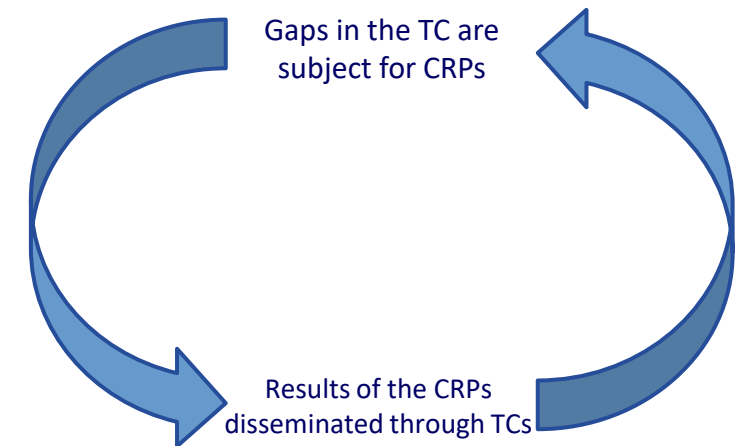
- o The IAEA Technical Cooperation Department (TC) facilitates the transfer of nuclear and related technologies.
- o TC works in full partnership with the IAEA Technical Departments.
- o Over US\$ 70 million per year in nearly 100 developing countries.
- o Project proposals are approved in a 2-year cycle.
- o Submitted by local institutions through national atomic energy authorities
- o Provides supports for expert missions, fellowships, and equipment.
- o Projects last for 2-4 years and amount for ~US\$ 100,000 per year



Modalities of Cooperation

Coordinated Research Projects (CRPs)

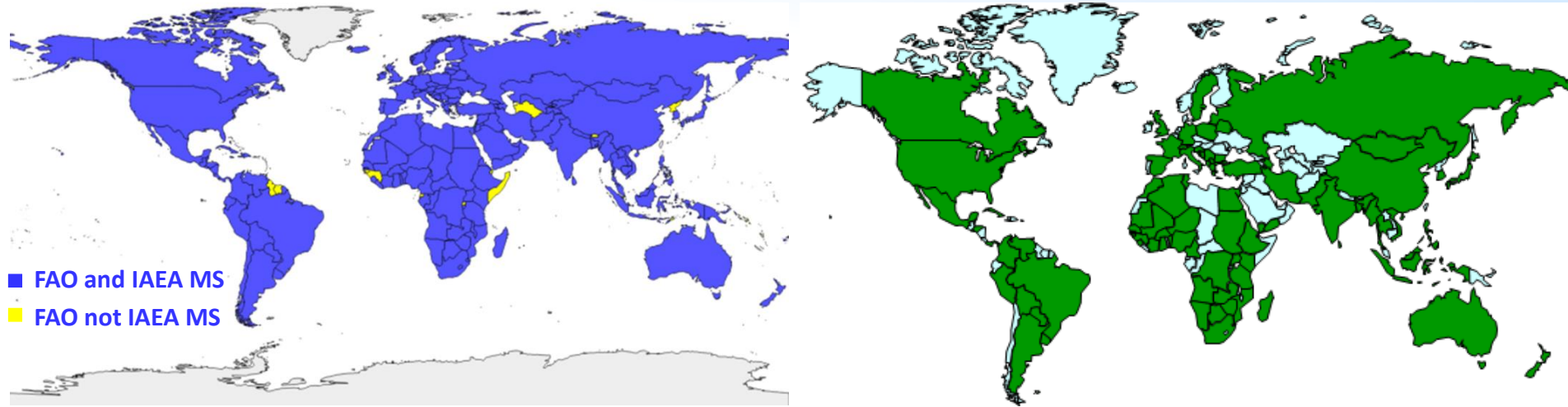
- o Bring together research institutes in both developing and developed countries to network on a specific research topic
- o Research is done within an operational framework and well defined global or regional thematic or problem focus
- o CRPs are composed by 6 - 15 Research Contract holders, 2 - 5 Agreement holders, and 1 - 2 Technical Contract holders
- o CRPs last for 5 years
- o 3 - 4 Research Coordination Meetings (RCM) are held to evaluate and harmonize activities
- o The results are freely available through IAEA's publications and relevant international journals
- o The new knowledge is transferred to relevant TC projects



Sub-programme Activity Areas

>60 TC and 6 CRP per year

Countries cooperating with the APH programme

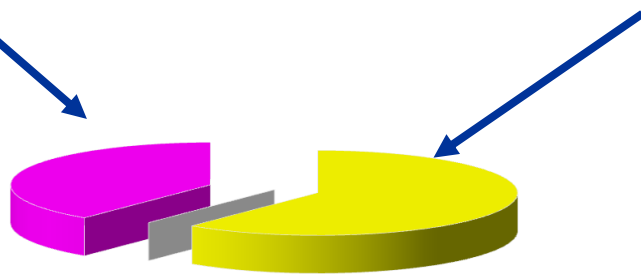


174 IAEA Member States (<https://www.iaea.org/about/memberstates>). Last access: February 2022

195 FAO Member States (<http://www.fao.org/legal/home/fao-members/en/>). Last access: February 2022

Animal Production (40%)
(improving nutrition, reproduction & breeding)

Animal Health (60%)
(control & disease diagnosis)



Working in Partnership

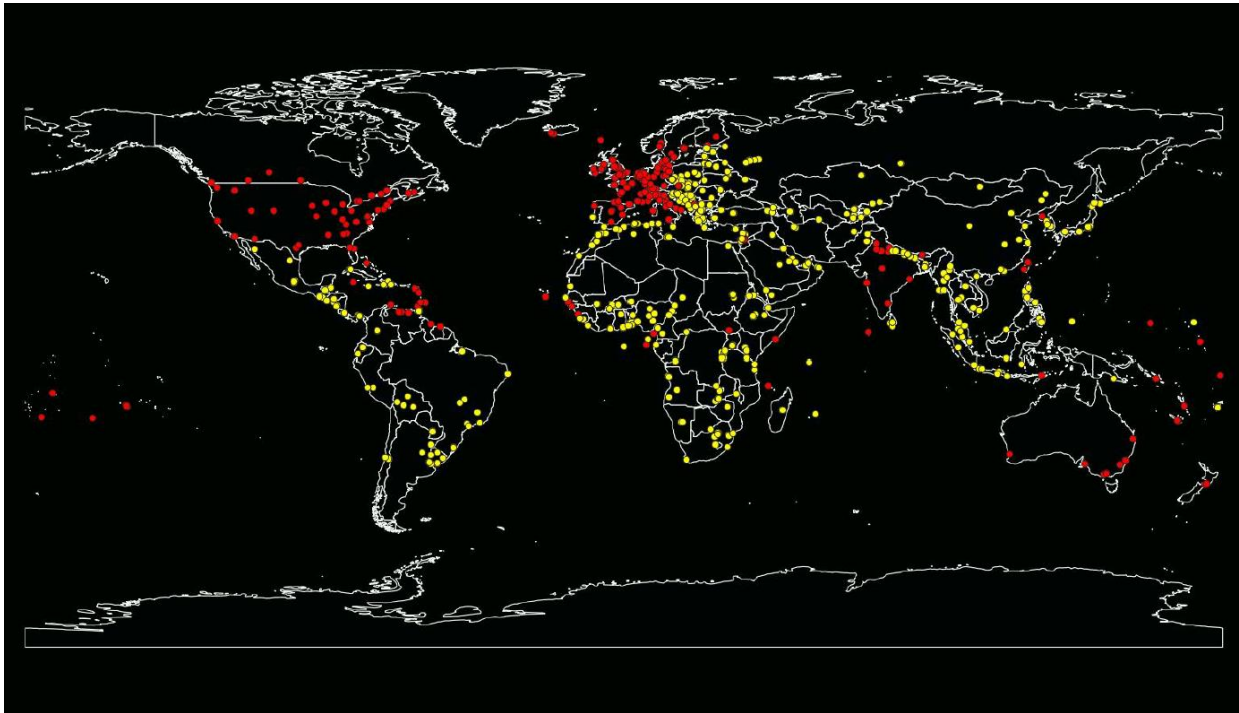
- ❖ FAO Animal Production and Health Division (NSA)
- ❖ International Livestock Research Institute (ILRI)
- ❖ World Organization for Animal Health (WOAH)
- ❖ AU/IBAR and AU/PANVAC
- ❖ World Health Organization (WHO)
- ❖ Pan American Health Organization (PAHO)
- ❖ EU Commission

❖ **plus FAO & IAEA Member States**

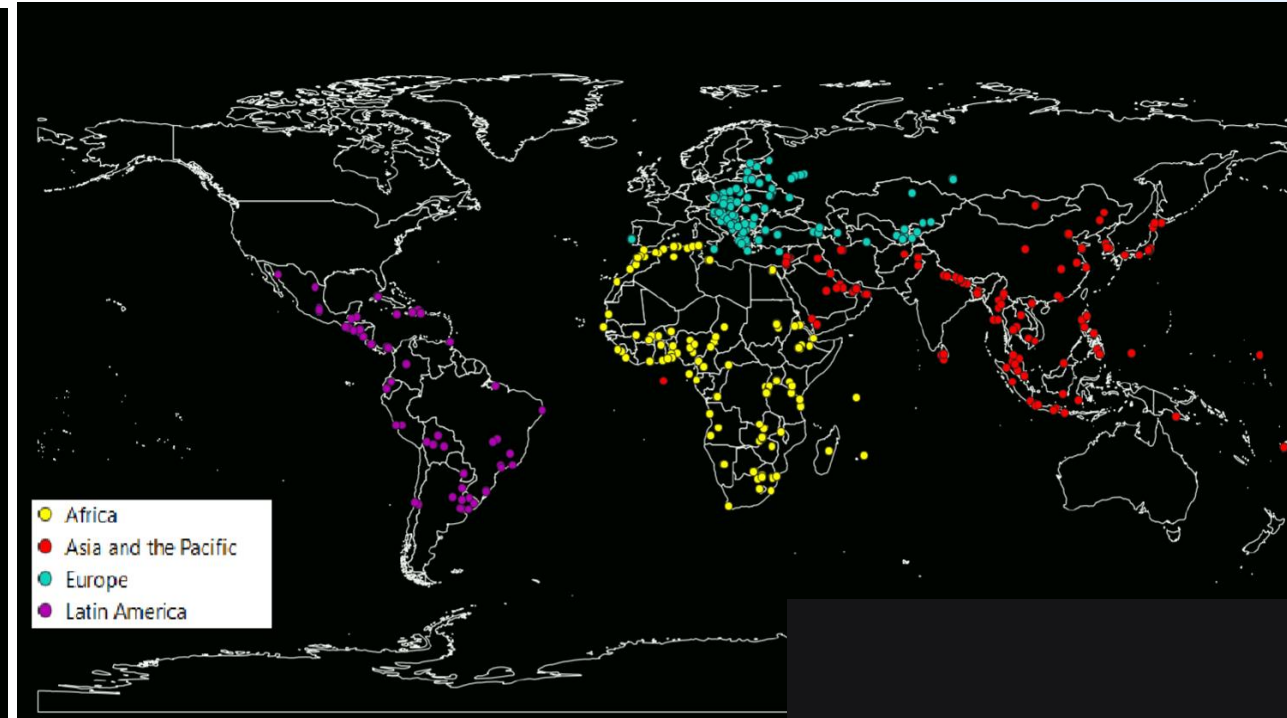
- ✓ 174 IAEA Member States
- ✓ 195 FAO Member States

Collaborating institutions

Institutions in Recipient (yellow spots) and Non-Recipient (red spots) Member States



Institutions in Recipient Member States by IAEA Regional Categorization (main target in the Technical Cooperation Programme)



~2300 institutions

~8100 contact persons

~42% staff in APH Laboratories

~19% staff in APH Authorities

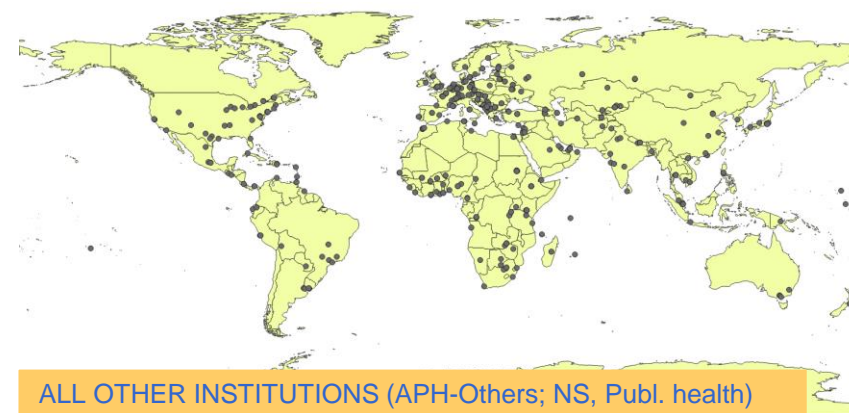
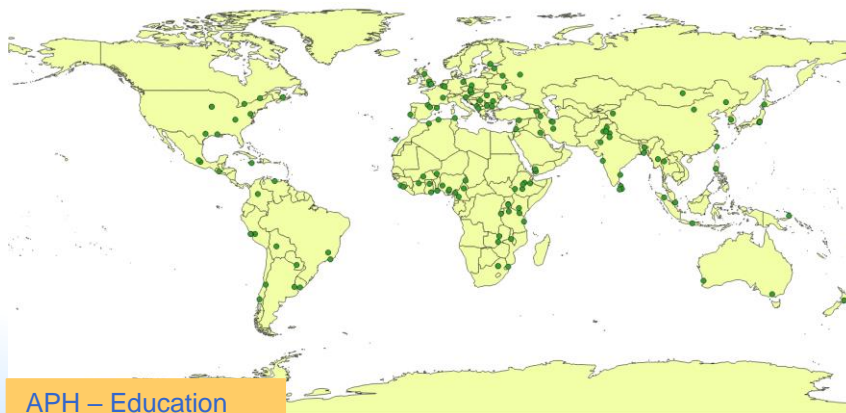
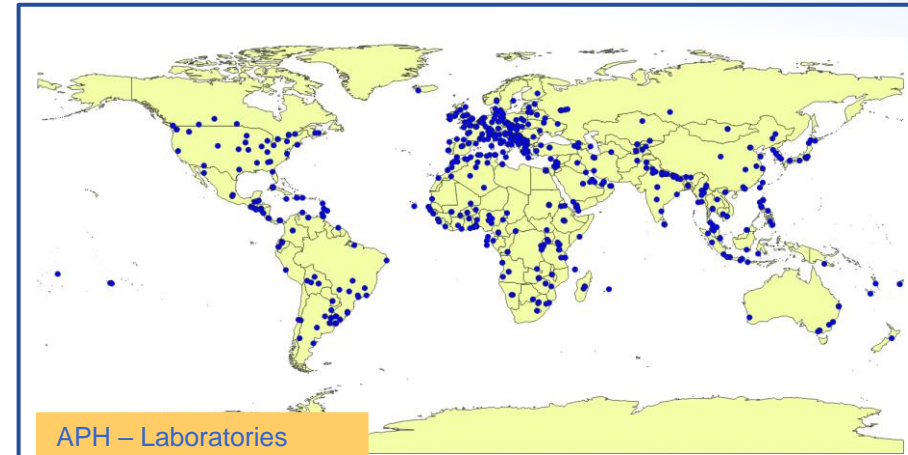
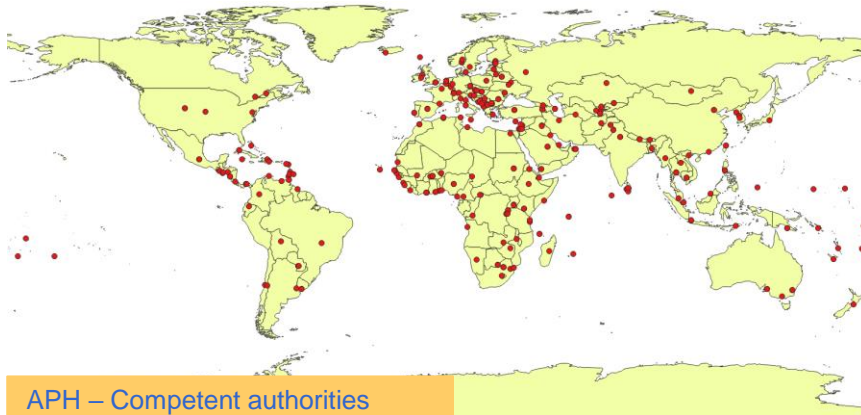
~39% institutions of other sectors

* Numbers are updated on daily basis. Data as of September 2024

Collaborating institutions

Different institutions have different roles in the animal production and health

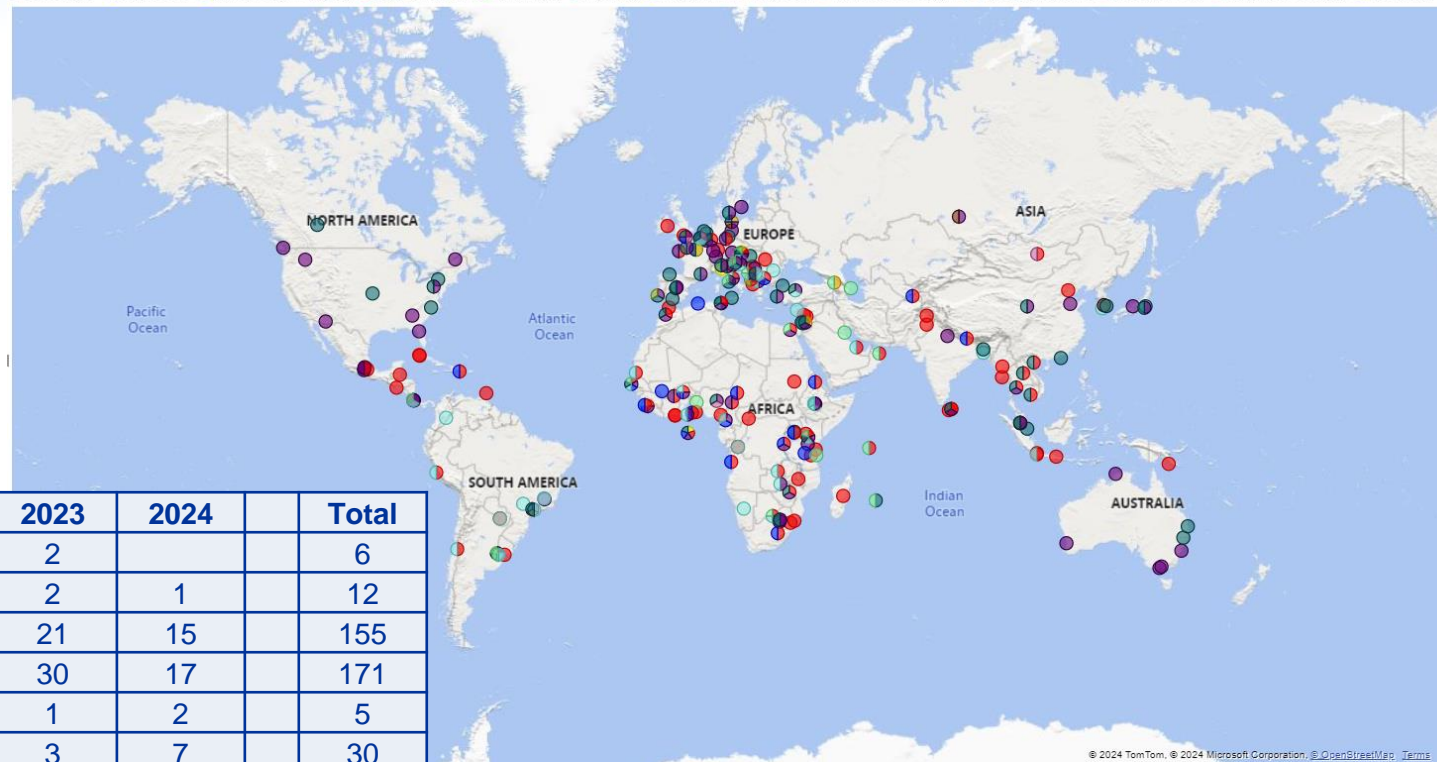
-Especially for laboratories (national and international assignments, as well as involvements in the APH Sub-programme)



Events organized under the APH Sub-programme (ALL)

(1 January 2018 – 15 September 2024)

Event Type ● Conference ● Consultants Meeting ● Expert Mission ● Fellowship ● Meeting ● National Training Co... ● Regional Training ... ● Research Coor... ● Scientific visit ● Technical Meeting ● Workshop



Event Type	2018	2019	2020	2021	2022	2023	2024	Total
Conference		1		2	1	2		6
Consultants Meeting	3	2	1	2	1	2	1	12
Expert Mission	32	36	13	17	21	21	15	155
Fellowship	20	40	10	23	31	30	17	171
Meeting				1	1	1	2	5
National Training Course	5	2	1	10	2	3	7	30
Open Event							2	2
Regional Training Course	8	7	3	9	8	14	7	56
Research Coordination Meeting	3	3	1	1	1	2	1	12
Scientific visit	12	14	11	19	18	24	10	108
Seminar							1	1
Side Event		1	2	1				4
Technical Meeting	4	1	1	4	6	10	5	31
Workshop	2			1	1	1		5
Total	89	107	43	90	91	110	68	598

Events organized under the APH Sub-programme (ASF only)

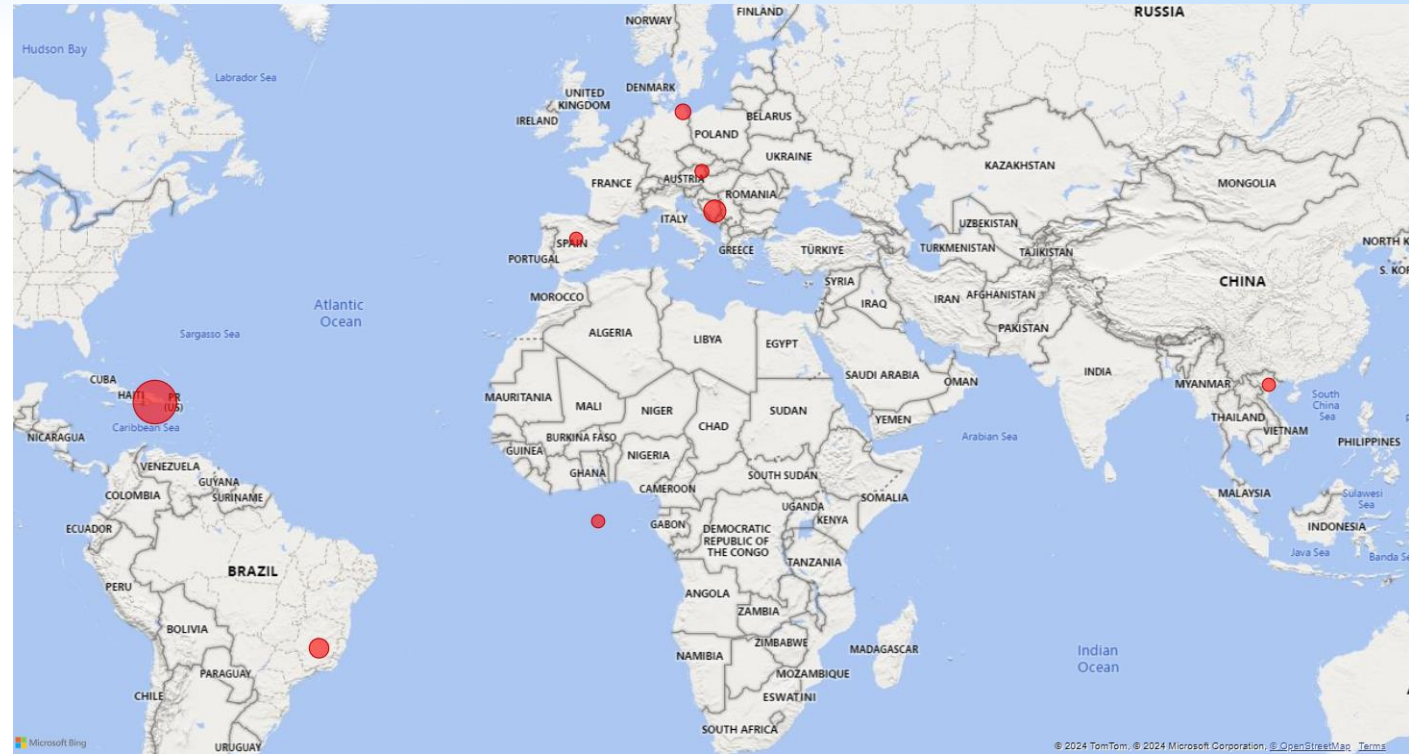
(1 January 2018 – 15 September 2024)

Number of events

Event type	2018	2019	2021	2022	2023	2024		Total
Consultants Meeting	1							1
Expert Mission		1	1					2
Fellowship					1			1
National Training Course			1					1
Regional Training Course				1				1
Research Coordination Meeting	1							1
Scientific visit					1	1		2
Technical Meeting				1				1
TOTAL:	2	1	2	1	3	1		10

Number of participants

Event type	2018	2019	2021	2022	2023	2024		Total
Consultants Meeting	1							1
Expert Mission		1	3					4
Fellowship					1			1
National Training Course			123					123
Regional Training Course					27			27
Research Coordination Meeting	10							10
Scientific visit					1	1		2
Technical Meeting				37				37
TOTAL:	11	1	126	37	29	1		205



* The spot on Latitude=0; Longitude=0 is an institution without geo-reference

Emergency Diagnostic Packages delivered through the APH Sub-programme (ASF only)

(1 January 2018 – 15 September 2024)

Support delivered to:

- 3 regions
- 14 MSs (6 Europe; 2 L. America; 6 ASIA)
- Total value: >2.000.000 Euros

Region	MS	Year
Europe	Bosnia and Herzegovina	2023
Europe	Croatia	2023
Europe	Montenegro	2023
Europe	Multiple	2023
Europe	Serbia	2023
Europe	Bosnia and Herzegovina	2022
Latin America	Cuba	2021
Latin America	Dominican Republic	2021
Asia	Cambodia	2019
Asia	Lao PDR	2019
Asia	Mongolia	2019
Asia	Myanmar	2019
Asia	Thailand	2019
Asia	Vietnam	2019

iVetNet Information Platform – One Stop Shop for Information Sharing

Diseases and techniques performed in the laboratories

Original and adapted SOPs

Possibility to review, select and download validated SOPs from the common roster

iVetNet DISCLAIMER: The iVetNet is a software application **under development** under the IAEA Coordinated Research Project D32032: Veterinary Diagnostic Laboratory Network (iVETLAB Network) to Prevent and Control Transboundary Animal Diseases (TADs).

NALETOSKI, Ivancho | Home | Send feedback | Change password | Log off

Institutions Feedback

Parameter Information

Parameter Type: Animal disease

Parameter: African Horse Sickness

Show Local Techniques:

Show parameters for selected type

Search

Institutions Further reading Recommended techniques

SOP ID	Source Institution	Source Institution Pl...	Source Institut...	Technique Name	Technique Category	Used for sequencing?	OS-L	OS-S	AS-L	AS-S	SR
945	International Atomic Energy Agency (IAEA): Department of Nuclear Sciences and Applications - Joint FAO/IAEA Centre: Animal Production and Health (APH) Sub-programme	Vienna	Austria	Conventional RT-PCR for Detection of the African Horse Sickness Virus.	PCR-Conventional/Molecular/Pathogen detection	Yes	0	0	0	1	0
944	ANSES (National Agency for Food Safety, Environment and Work) - Anses Maisons-Alfort Animal Health Laboratory; Animal Health Laboratory	Maisons-Alfort	France	Conventional RT-PCR amplification of the serotype-specific genome segment 2	PCR-Conventional/Molecular/Pathogen detection	No	0	0	0	1	1
946	Department of Agriculture: Food and Environment - Center for Research in Animal Health (CISA); National Institute of Agricultural and Food Research and Technology (INIA)	Valdeolmos (Madrid)	Spain	Real Time RT-PCR for Detection of African Horse Sickness Virus.	PCR-Real Time/Molecular/Pathogen detection	No	0	0	0	1	1
1252	Department of Agriculture: Food and Environment - Center for Research in Animal Health (CISA); National Institute of Agricultural and Food Research and Technology (INIA)	Valdeolmos (Madrid)	Spain	Rapid and sensitive detection of African horse sickness virus by real-time PCR.	PCR-Real Time/Molecular/Pathogen detection	No	0	0	0	0	1
965	The Pirbright Institute -	Pirbright	United Kingdom (the)	Real Time RT-PCR Assays for Detection and Typing of African Horse Sickness Virus	PCR-Real Time/Molecular/Pathogen detection	No	0	0	0	0	1

1 - 5 of 5 items

Attachments to each SOP

OS-L=Original SOP, long version

OS-S=Original SOP, short version

AS-L=Adapted SOP, long version

AL-S=Adapted SOP, short version

SR=Source reference

Number of attachments present

iVetNet Information Platform – One Stop Shop for Information Sharing

Diseases and techniques performed in the laboratories

Original and adapted SOPs

- SOPs from multiple developers adapted into a single template for distribution in various member states;
- Format adjustment to be performed locally (headers, names etc....);
- Template and a verification in local laboratories;
- Clear reference to the developing laboratory

SPACE FOR HEADER 01 (1st page only)
-To be defined-

Version	1	01/01/2011
Date of issue		
Date of expiry		

SOP NAME
SOP ID NUMBER

Blank SOP template

Prepared by	Position	Date	Signature
Reviewed by	Position	Date	Signature
Authorized by	Position	Date	Signature
Controlled by	Position	Date	Signature

Content

1. Scope or field of application
2. Definition
3. Principle
4. Safety
5. Media, reagents, reagents and other products
6. Equipment required
7. Procedure
8. Calculation of results
9. Reporting
10. Waste disposal
11. References
12. Validation
13. Deviation of standard method
14. Revision history and changes
15. Location of this SOP

The SOP has been adapted by the Animal Production and Health Section of the Joint FAO/IAEA Centre, Vienna, Austria under the framework of the IAEA Coordinated Research Project (CRP) 5202. The SOP is provided as a template only. It is the responsibility of the user to adapt it to their own laboratory. The user must verify the accuracy of the information provided in this document.

SPACE FOR SOP HEADER 02 (all other pages)
-To be defined-

1. Scope / field of application

2. Definition

3. Principle

SPACE FOR HEADER 01 (1st page only)
-To be defined-

SPACE FOR SOP HEADER 02 (all other pages)
-To be defined-

FLUORESCENT ANTIBODY VIRUS NEUTRALIZATION (FAVN) TEST FOR DETECTION OF POSTVACCINAL ANTRAXIS ANTIBODIES

SOP ID NUMBER

SOP for FAVN - rabies

Prepared by	Position	Date	Signature
Reviewed by	Position	Date	Signature
Authorized by	Position	Date	Signature
Controlled by	Position	Date	Signature

Content

1. Scope or field of application
2. Definition
3. Principle
4. Safety
5. Media, reagents, reagents and other products
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SPACE FOR SOP HEADER 02 (all other pages)
-To be defined-

Detection of antibodies against Brucellosis using Complement Fixation Test (CFT)

SOP ID NUMBER

SOP for CFT - brucellosis

Prepared by	Position	Date	Signature
Reviewed by	Position	Date	Signature
Authorized by	Position	Date	Signature
Controlled by	Position	Date	Signature

Content

1. Scope or field of application
2. Definition
3. Principle
4. Safety
5. Media, reagents, reagents and other products
6. Equipment required
7. Procedure
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SPACE FOR SOP HEADER 02 (all other pages)
-To be defined-

1. Scope / field of application

The present document describes a standard technique aiming at detecting antibodies specific of smooth Brucella species (sensu lato) of abortion, of neonatal and of adult. In the complement fixation test an animal sera (serum), equine, bovine, canine and feline, both adult and neonatal, in particular.

2. Definition

Complement - A serum molecular complex, some components of which may be themselves to specific antibodies/immune complex.

Haemolysis - Serum from a hyper-immunized animal against heterologous red blood cells (RBC) erythrocytes, with a suspension of red blood cells antibodies and causes to agglutinate RBC of specific corresponding erythrocytes whenever the complement is present.

Resuspended RBC - A mixture of pre-immunized quantities of a suspension of red blood cells (RBC) of a specific haemolysis.

CRBS - Co-International Reference Serum

RUHS - CR 18318 - Implementation of all of the analytical phases of a procedure (from cell continuity or identification, separated by dual examination, by the other (operator) in the same location, with the same equipment and the same reagents).

Test serum - Serum as any antibody or an index to sheep red blood cells.

4. Safety

The test is performed in a laboratory with appropriate biosafety level.

5. Media used

Not applicable.

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SPACE FOR SOP HEADER 02 (all other pages)
-To be defined-

CHARACTERIZATION OF NEWCASTLE DISEASE VIRUS (AVIAN PARAMYXOVIRUS TYPE 1) USING HAEMAGGLUTINATION INHIBITION TEST

SOP ID NUMBER

SOP for HI test for NDV

Prepared by	Position	Date	Signature
Reviewed by	Position	Date	Signature
Authorized by	Position	Date	Signature
Controlled by	Position	Date	Signature

Content

1. Scope or field of application
2. Definition
3. Principle
4. Safety
5. Media, reagents, reagents and other products
6. Equipment required
7. Procedure
8. Calculation of results
9. Reporting
10. Waste disposal
11. References
12. Validation
13. Deviation of standard method
14. Revision history and changes
15. Location of this SOP

The SOP has been adapted by the Animal Production and Health Section of the Joint FAO/IAEA Centre, Vienna, Austria under the framework of the IAEA Coordinated Research Project (CRP) 5202. The SOP is provided as a template only. It is the responsibility of the user to adapt it to their own laboratory. The user must verify the accuracy of the information provided in this document.

SPACE FOR SOP HEADER 02 (all other pages)
-To be defined-

1. Scope / field of application

This test describes the procedure for characterization of Newcastle disease virus with known reference sera using haemagglutination inhibition test.

2. Definition and acronyms

HA - Haemagglutination

HAIC - Haemagglutination Inhibition

HI - Haemagglutination Inhibition

CRBS - Co-International Reference Serum

RBCs - red blood cells

CRS - specific antibody reagent

The HA test is the highest dilution of reference antigen causing complete agglutination of 1% RBCs (no clumping).

The HI test is the highest dilution of serum causing complete inhibition of 4 equal of reference antigen agglutination (1% RBC).

3. Principle

The diagnostic method is based on the capability of Newcastle disease virus to agglutinate the erythrocytes of poultry due to the surface of HA protein, unlike the haemagglutinin in the presence of specific antibodies in the known reference serum. Reference sera are added to the virus and will result in inhibition of haemagglutination.

4. Safety

The test is performed in a laboratory with appropriate biosafety level.

5. Media, reagents, reagents and other products required

5.1 Media

Not applicable.

5.2 Reagents

5.2.1 Inactivated PBC (1:10, pH 7.0-7.2)

5.2.2 Inactivated CRBS (1:10 or other percentage)

5.2.3 RBCs suspension

5.2.4 Reference antigen, test

5.3 Reagents

5.3.1 Reference antiserum (CRS/1)

5.4 Equipment required

Not applicable.

The SOP has been adapted by the Animal Production and Health Section of the Joint FAO/IAEA Centre, Vienna, Austria under the framework of the IAEA Coordinated Research Project (CRP) 5202. The SOP is provided as a template only. It is the responsibility of the user to adapt it to their own laboratory. The user must verify the accuracy of the information provided in this document.

iVetNet Information Platform – One Stop Shop for Information Sharing

SOPs for ASF

Institutions **Feedback**

Parameter Information

Parameter Type:

Parameter:

Show Local Techniques:

Show parameters for selected type

Institutions **Further reading** **Recommended techniques**

SOP ID	Source Institution	Source Insti...	Source Insti...	Technique Name	Technique Category	Used for seq...	OS-L	OS-S	AS-L	AS-S	SR		
953	Department of Agriculture; Food and Environment - Center for Research in Animal Health (CISA); National Institute of Agricultural and Food Research and Technology (INIA)	Valdeolmos (Madrid)	Spain	Production of Immunoblotting strips for ASF antibody detection.	Immunoblotting/Immunoblotting/Serology	No	1	0	0	0	0		
1384	Immunology and Applied Genetics, SA (INGENASA) -	Madrid	Spain	Immunochromatographic assay for detection of antibodies to African swine fever virus (ASFV) in porcine whole blood or serum	Immunochromatography qualitative/Immunochromatography/Serol...	No	1	0	0	0	0		
954	Department of Agriculture; Food and Environment - Center for Research in Animal Health (CISA); National Institute of Agricultural and Food Research and Technology (INIA)	Valdeolmos (Madrid)	Spain	Detection of ASFV antibodies Indirect Immunoperoxidase test (IPT).	Immunohistochemistry/Histochemistry/Pa...	No	1	0	0	0	0		
955	Department of Agriculture; Food and Environment - Center for Research in Animal Health (CISA); National Institute of Agricultural and Food Research and Technology (INIA)	Valdeolmos (Madrid)	Spain	Conventional PCRs for ASFV Genotyping (p72, p54 and CVR).	PCR-Conventional/Molecular/Pathogen detection	Yes	2	0	2	2	1		
1293	International Atomic Energy Agency (IAEA); Department of Nuclear Sciences and Applications - Joint FAO/IAEA Centre; Animal Production and Health (APH) Sub-programme	Vienna	Austria	Insulated isothermal PCR (iiPCR) for detection of ASF Virus (GeneReach)	PCR-Insulated isothermal (iiPCR)/Molecular/Pathogen detection	No	0	0	0	0	1		
60	Complutense University of Madrid (UCM) - Veterinary school; HCV Basement floor; Veterinary Health Surveillance Center (VISAVET)	Madrid	Spain	Real Time PCR Protocol for Detection of the African Swine Fever Virus (ASFV).	PCR-Real Time/Molecular/Pathogen detection	No	2	0	2	2	1		
291	Friedrich-Loeffler-Institute (FLI) - Riems - Federal Research Institute for Animal Health	Greifswald; Insel Riems	Germany	Two SOPs for confirmation of the ASFV (alternative Real time RT-PCR), in cases when the initial real time RT-PCR is positive.	PCR-Real Time/Molecular/Pathogen detection	No	0	0	0	0	3		
1143	Department of Agriculture; Food and Environment - Center for Research in Animal Health (CISA); National Institute of Agricultural and Food Research and Technology (INIA)	Valdeolmos (Madrid)	Spain	Detection of African Swine Fever Virus (ASFV) by Real-Time Polymerase Chain Reaction (PCR) Using Universal Probe Library (UPL)	PCR-Real Time/Molecular/Pathogen detection	No	0	0	1	1	0		
1303	Senegalese Agricultural Research Institute (ISRA) - National Laboratory for Animal Husbandry and Veterinary Research (LNERV)	Dakar	Senegal	Detection of African Swine Fever Virus (ASFV) by Blood Direct Polymerase Chain Reaction (PCR)	PCR-Real Time/Molecular/Pathogen detection	No	0	0	1	0	1		
1438	Friedrich-Loeffler-Institute (FLI) - Riems - Federal Research Institute for Animal Health	Greifswald; Insel Riems	Germany	Real-time PCR ASFV (ASF-System1) - LAM03ASP-2 - King	PCR-Real Time/Molecular/Pathogen detection	No	3	0	2	2	0		

11 - 20 of 24 items

24 SOPs for ASF

Categorized by type of technique



iVetNet Information Platform – One Stop Shop for Information Sharing

SOPs for ASF

SPACE FOR HEADER 01 (First page only)
-To be defined-

Version:	x
Date of issue:	DD.MM.YYYY
Page of pages	x/y
Copy number	X

Detection Of African Swine Fever Virus (ASFV) By Real-Time Polymerase Chain Reaction (PCR)

SOP ID NUMBER

This SOP is adaptation of the original SOP developed by the Universidad Complutense De Madrid; Facultad de Veterinaria; Departamento de Sanidad Animal (OIE Reference Laboratory for ASF) and CISA-INIA, European Union Reference Laboratory for ASF (EURL-ASF), entitled "Standard Operating Procedure for Detection of African Swine Fever Virus (ASFV) by Real Time Polymerase Chain Reaction (PCR) (SOP/CISA/ASF/PCR/2)"

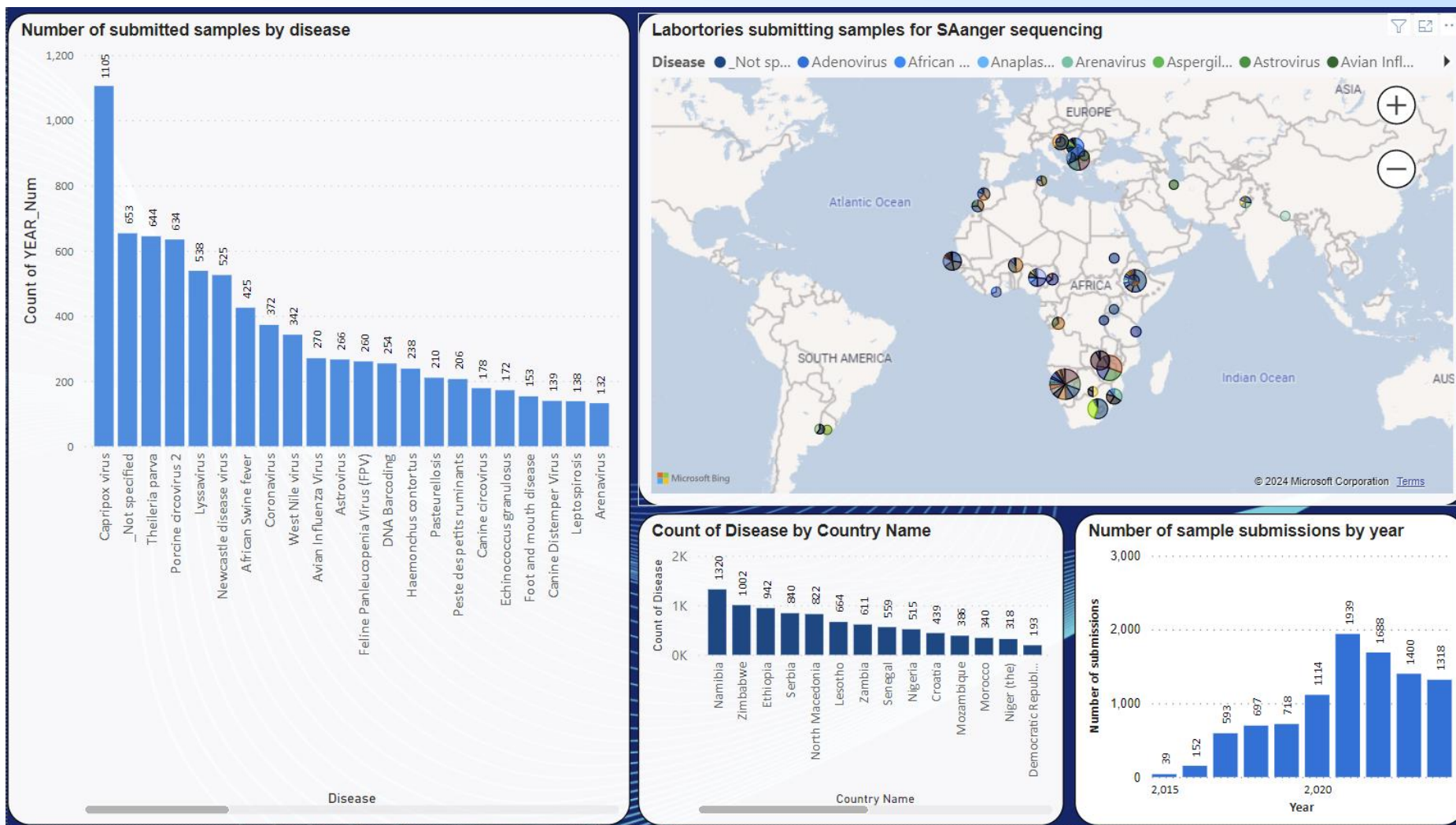
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Reviewed by:	Position:	Date:	Signature:
Authorized by:	Position:	Date:	Signature:
Controlled by:	Position:	Date:	Signature:

Content
1. Scope or field of application
2. Definition/Acronyms
3. Principle/Background information
4. Safety
5. Media, solutions, reagents and other products
6. Equipment required

Large portion in SOPs in ISO 17025 compatible format

Sanger sequencing service of APH (ALL SAMPLE SUBMISSION)

(full workflow and service free of charge for counterparts)

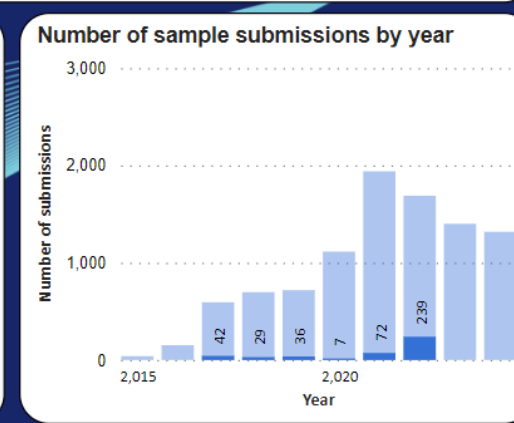
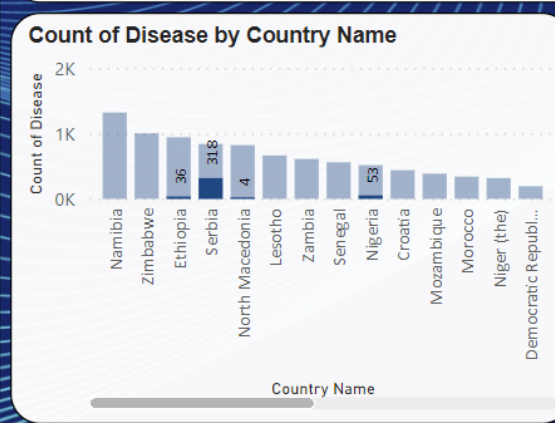
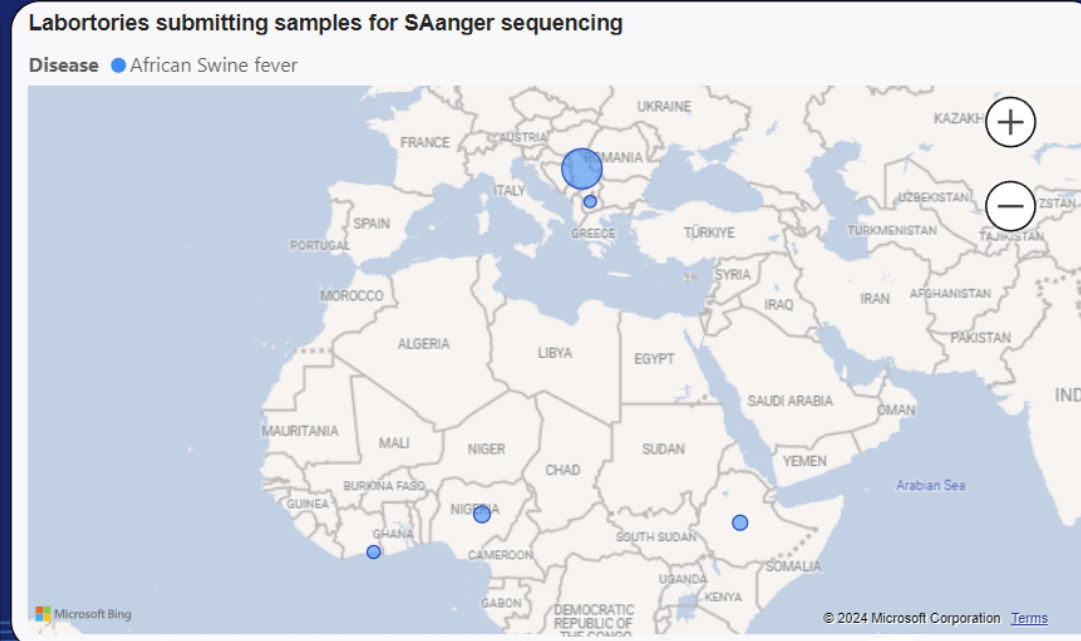
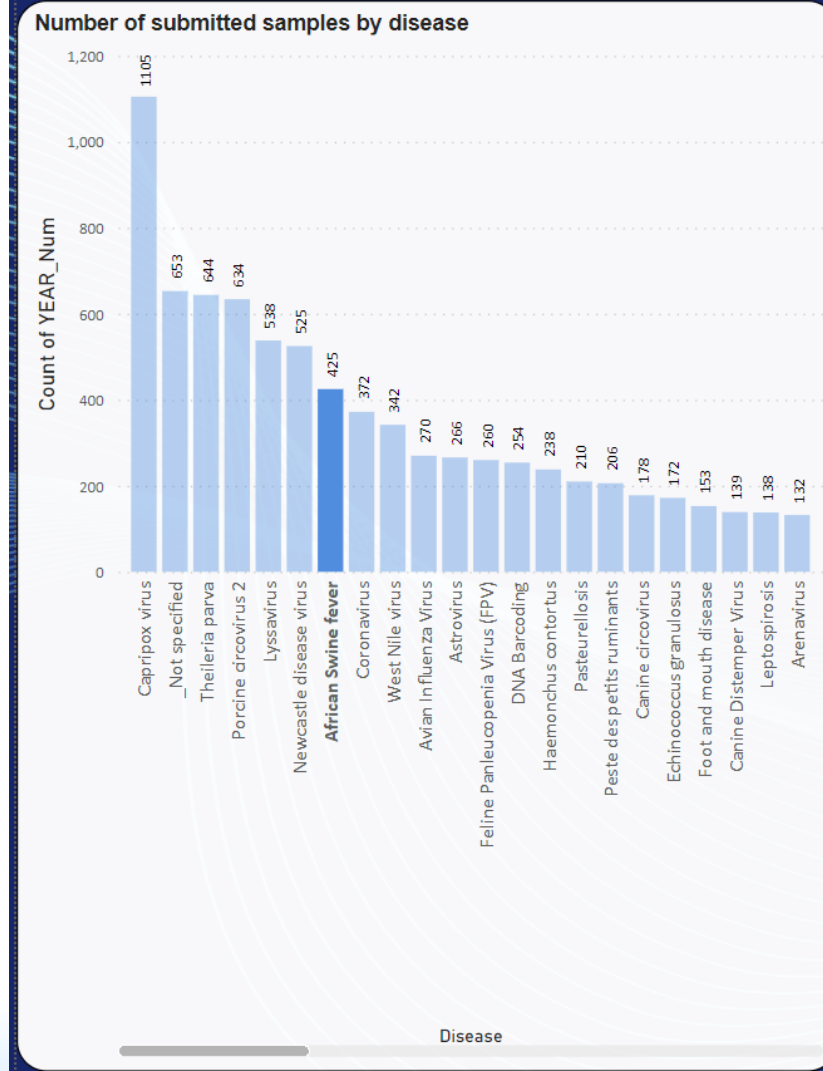


As of 30 June 2024:
 -9658 sample submissions
 -80 parameters (diseases)
 -7% unspecified target
 -61 publications / 54 in peer reviewed journals.



Sanger sequencing service of APH (ASF SUBMISSION)

(full workflow and service free of charge for counterparts)



Disease / Year	2017	2018	2019	2020	2021	2022	Grand Total
African Swine fever	42	29	36	7	72	239	425

As of 30 June 2024:
 -425 sample submissions for ASF
 -8 publications in peer reviewed journals



UNDER DEVELOPMENT !

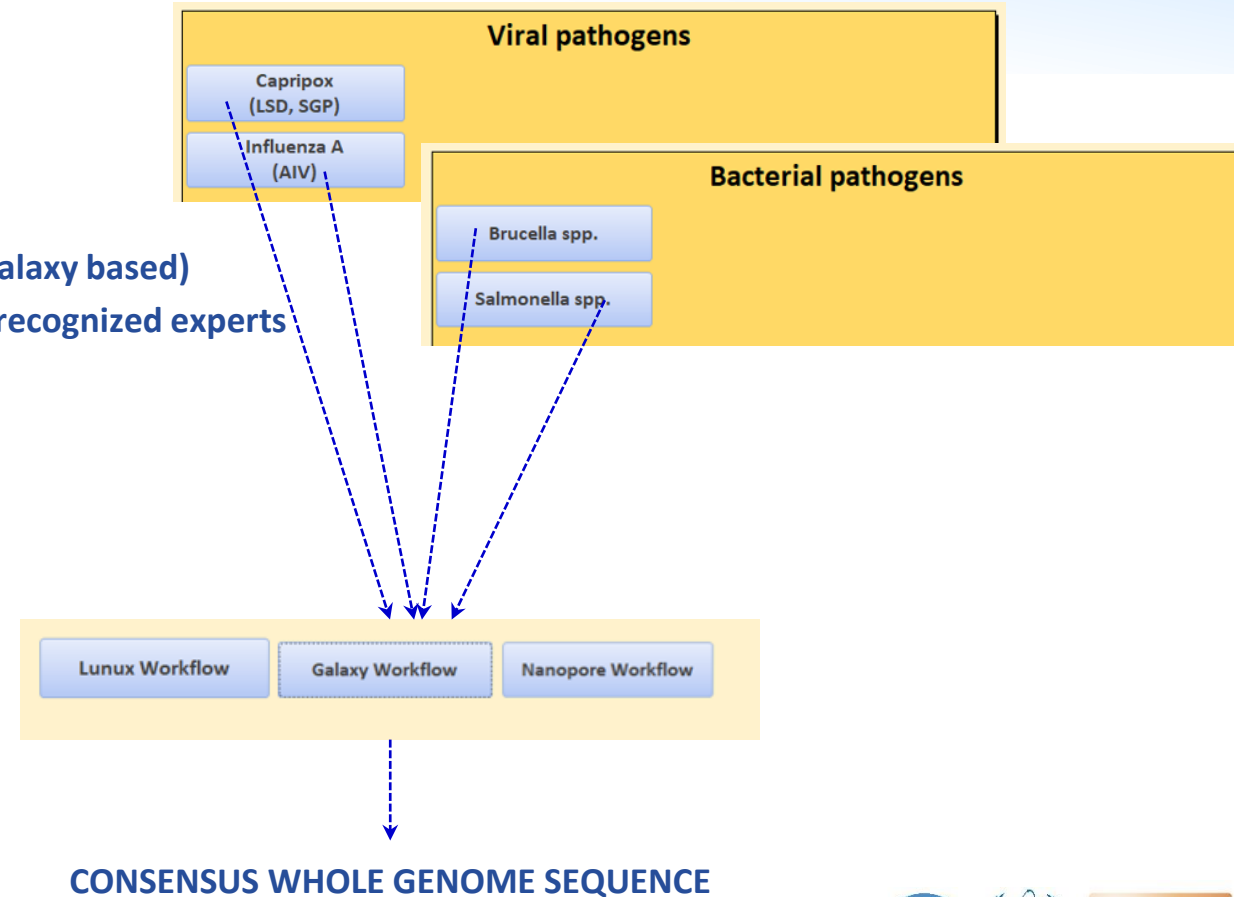
WGS service of APH (NOT EXCLUSIELY FOR ASF, BUT INCLUDES ASF)

CRP D32036

- Service based NGS (Illumina based) for all counterparts
- Free of charge for the whole counterpart community
- Instructions for sample prep up to bioinformatics (Linux based and Galaxy based)
- Switchboard for the workflows for specific pathogens, controlled by recognized experts

MinION

- Dissemination to selected laboratories
- Bioinformatics as above



-More information on ZODIAC: <https://www.iaea.org/services/zodiac>

UNDER DEVELOPMENT !

ZODIAC Pillar 3: Development of Real-Time Decision-Making Support Tools for Timely Interventions (NOT EXCLUSIELY FOR ASF, BUT INCLUDES ASF)



-Compatibility with:

- FAO EMPRES-i
- WOAH WAHIS
- SILAB (FAO + IZSAM Teramo)



-More information on ZODIAC: <https://www.iaea.org/services/zodiac>

-Screenshot source: Yuetong Ma, Federico Verly, Ivancho Naletoski (2024): Visualization Platform for Animal Health Monitoring Systems in Developing Countries. Poster, European Cartographic Conference – EuroCarto 2024, 9-11 September 2024 at TU Wien, Austria.





Thank You !



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