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

FAO
Agriculture and Consumer Protection Department

IAEA
Department of Nuclear Sciences and Applications

Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture

IAEA International Atomic Energy Agency

Soil & Water Management & Crop Nutrition Section	Soil & Water Management & Crop Nutrition Laboratory
Plant Breeding & Genetics Section	Plant Breeding & Genetics Laboratory
Animal Production & Health Section	Animal Production & Health Laboratory
Insect Pest Control Section	Insect Pest Control Laboratory
Food Safety and Control Section	Food Safety and Control Laboratory

IAEA HQ

Vienna centre

Vienna airport

Seibersdorf

FAO IAEA Joint FAO/IAEA Centre Nuclear Techniques in Food and Agriculture

Established 1964

Modalities of Cooperation
TC Projects (TCs)
Building capacities

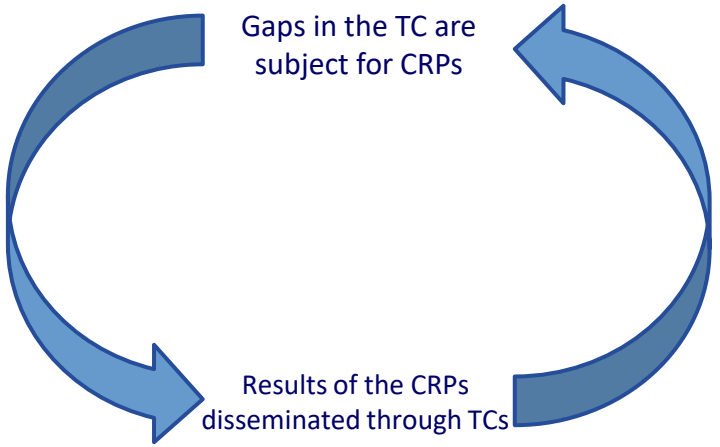
- The IAEA Technical Cooperation Department (TC) facilitates the transfer of nuclear and related technologies.
- TC works in full partnership with the IAEA Technical Departments.
- Over US$ 70 million per year in nearly 100 developing countries.
- Project proposals are approved in a 2-year cycle.
- Submitted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

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

Modalities of Cooperation

Coordinated Research Projects (CRPs)

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

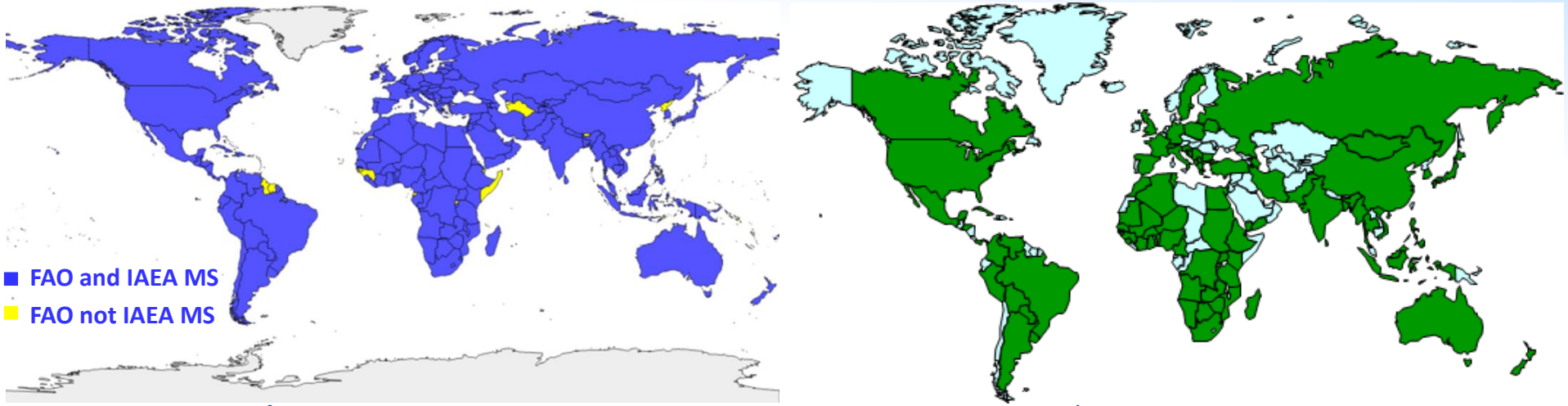


Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

Sub-programme Activity Areas

>60 TC and 6 CRP per year

Countries cooperating with the APH programme

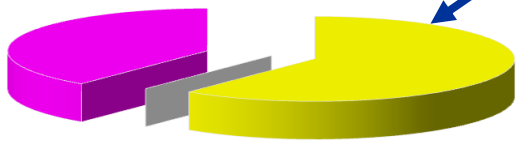


174 IAEA Member States (https://www.iaea.org/about/memberstates). Last access: February 2022

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)



Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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

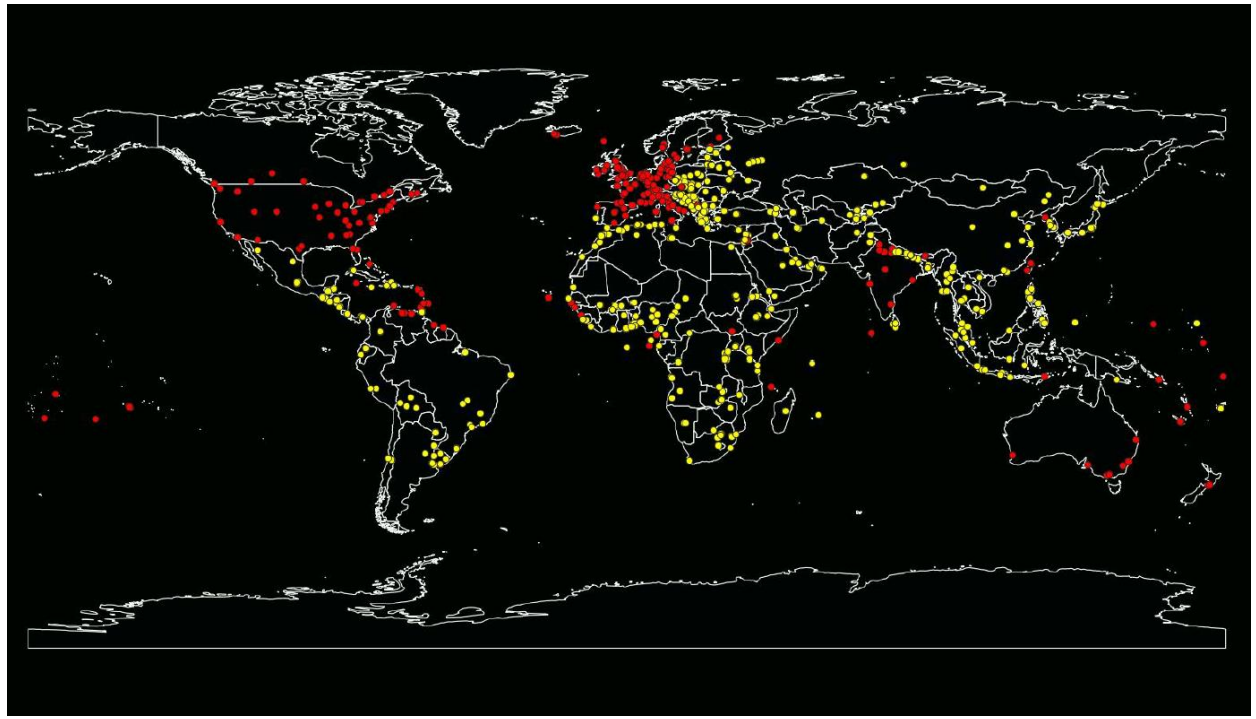
- **plus FAO & IAEA Member States**

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

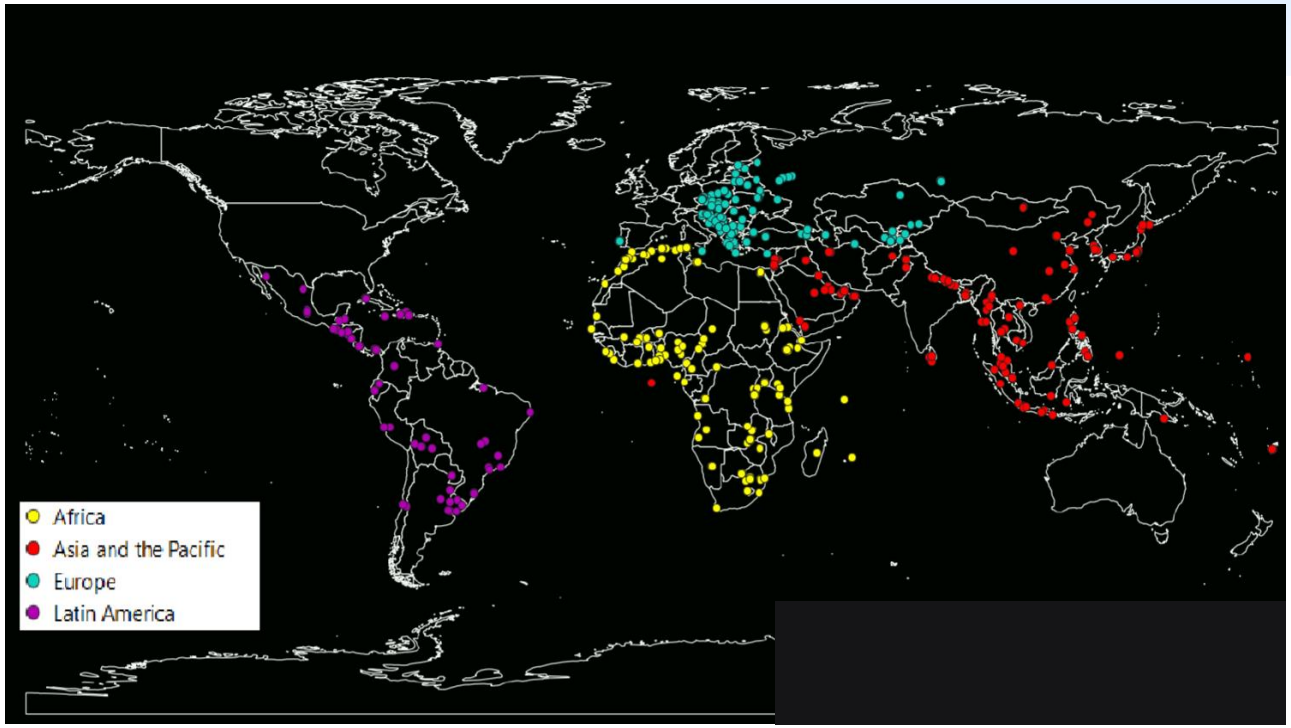
Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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

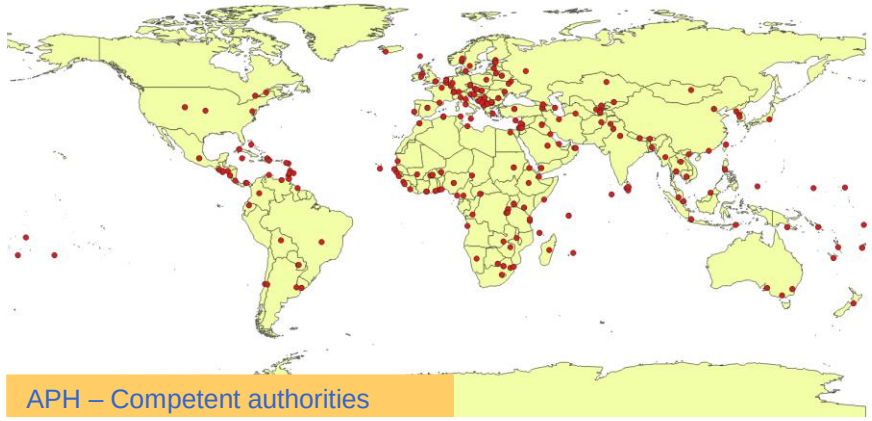
** Numbers are updated on daily basis. Data as of September 2024*

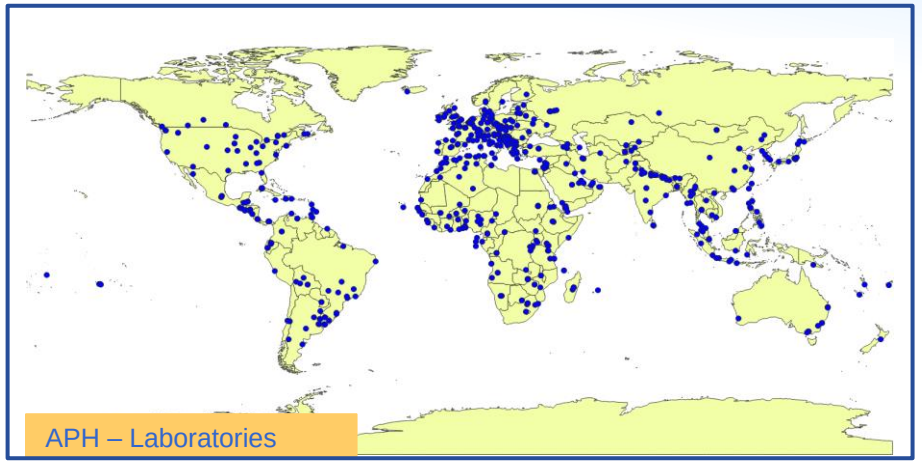
Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

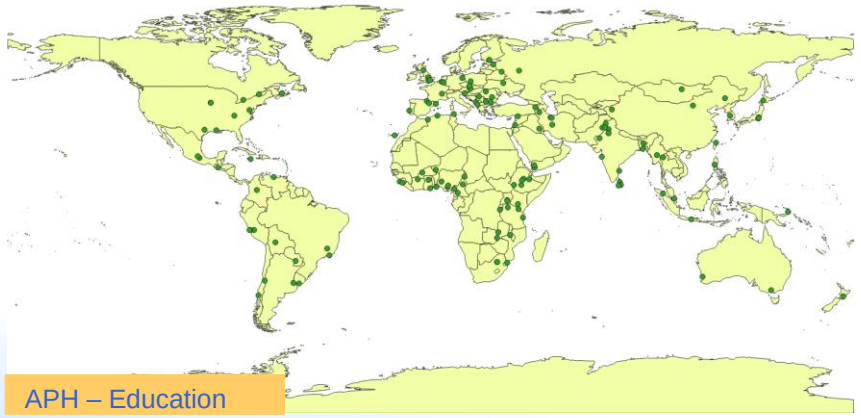
Collaborating institutions

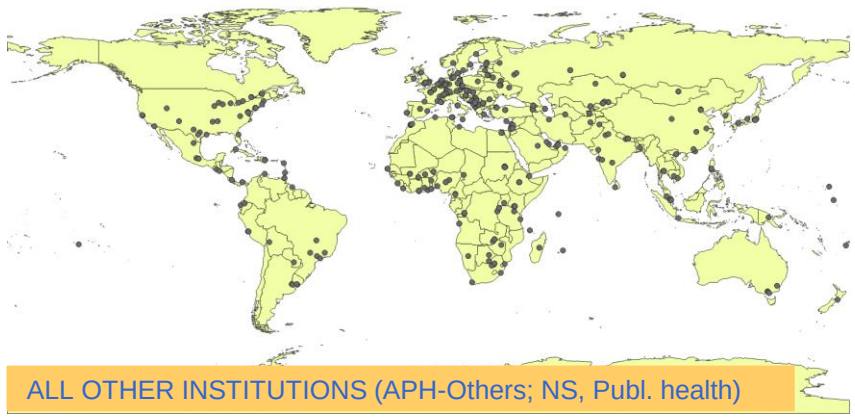
Different institutions have different roles in the animal production and health

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





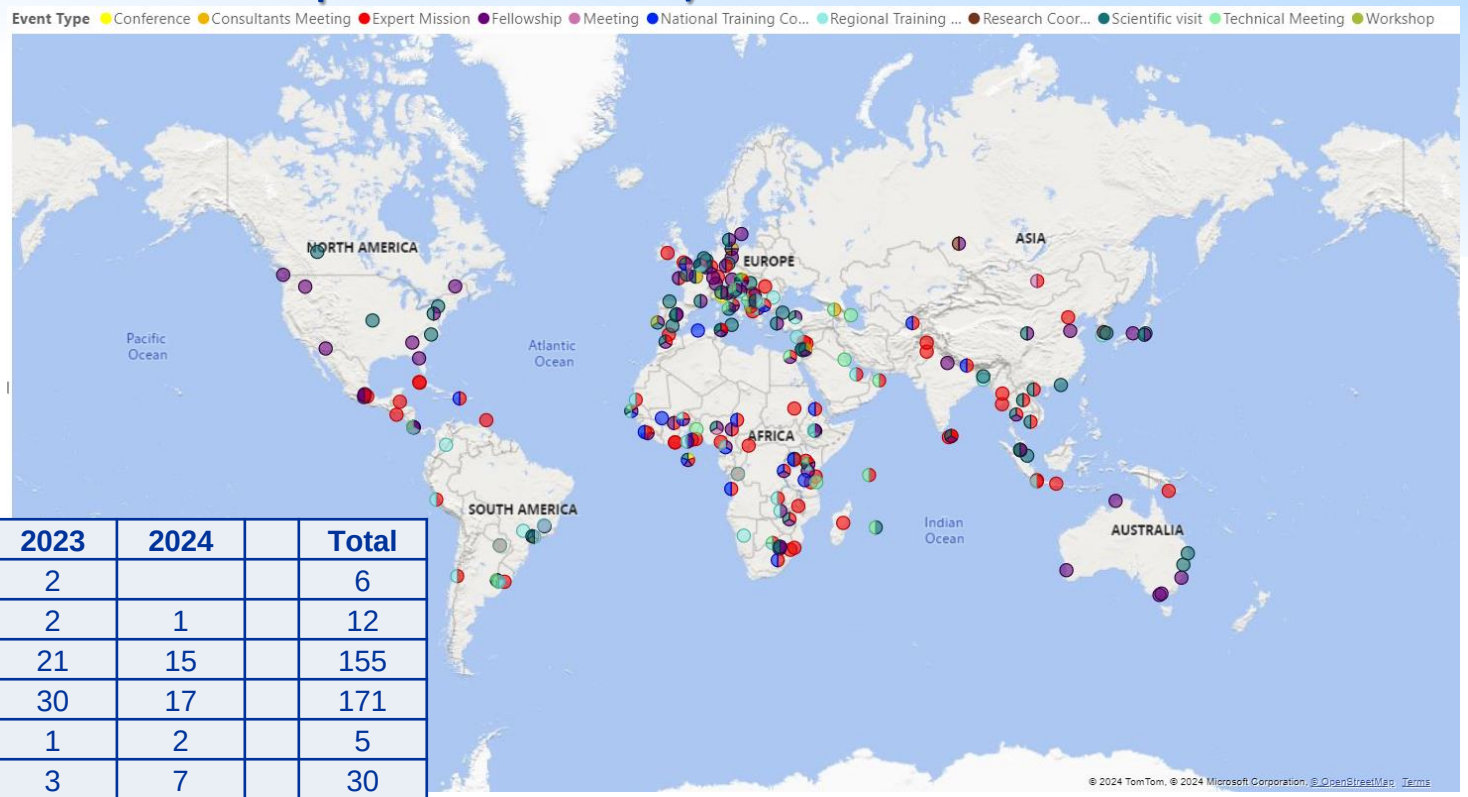




Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

Events organized under the APH Sub-programme (ALL)

(1 January 2018 – 15 September 2024)



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**

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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

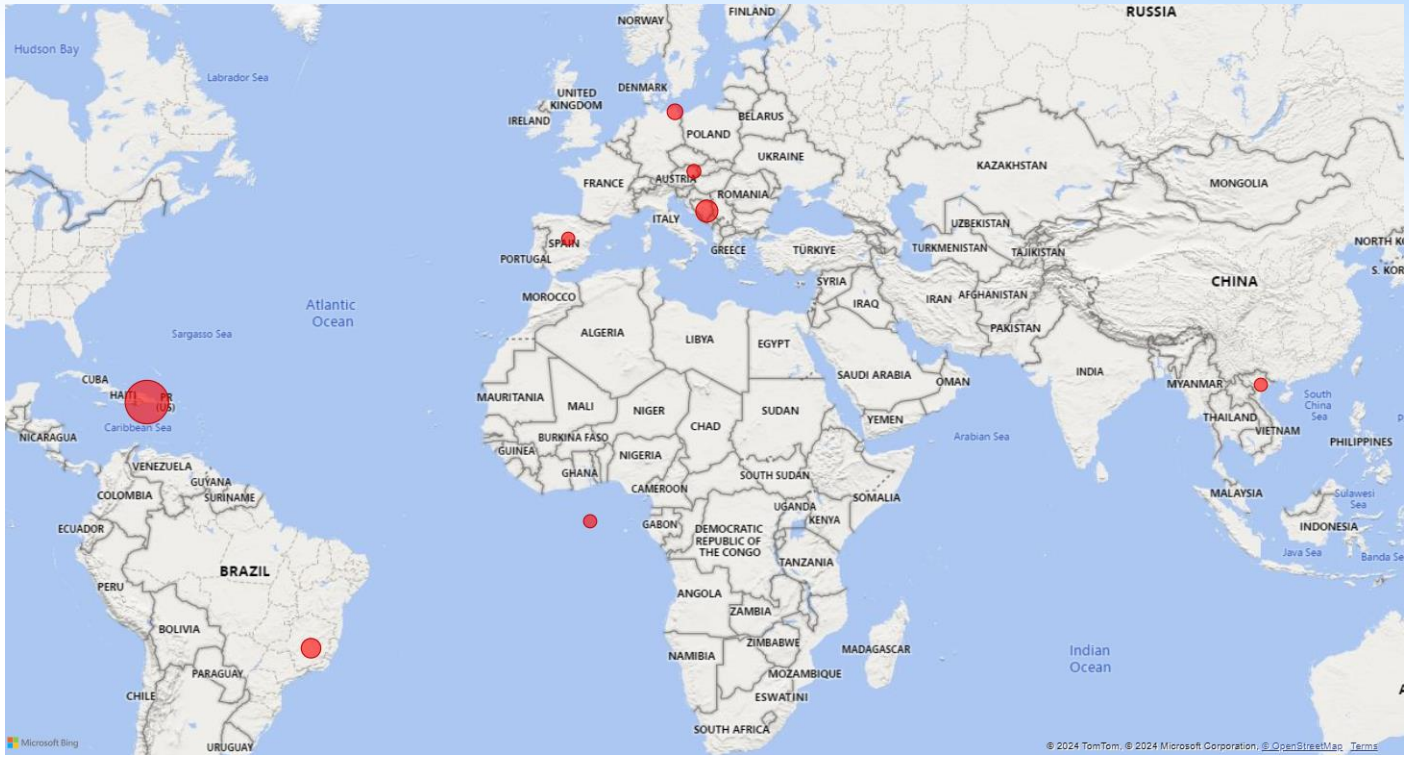
(1 January 2018 – 15 September 2024)

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*

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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

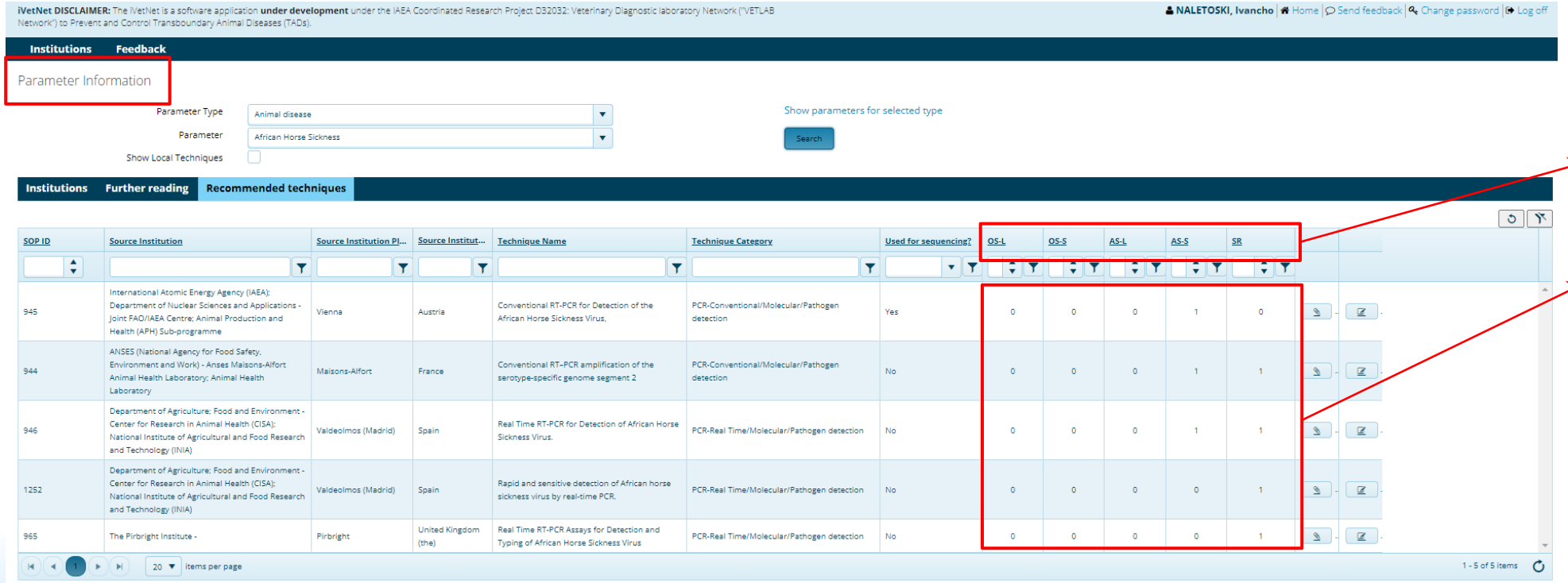
Region	MS	Year
Europe	Bosnia and Herzegovina	2023
Europe	Croatia	2023
Europe	Montenegro	2023
Europe	Multiple	2023
Europe	Serbia	2023
Europe	Bosnia and Herzegovina	2022
Latin America	Cuba	2021
Latin America	Dominican Republic	2021
Asia	Cambodia	2019
Asia	Lao PDR	2019
Asia	Mongolia	2019
Asia	Myanmar	2019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



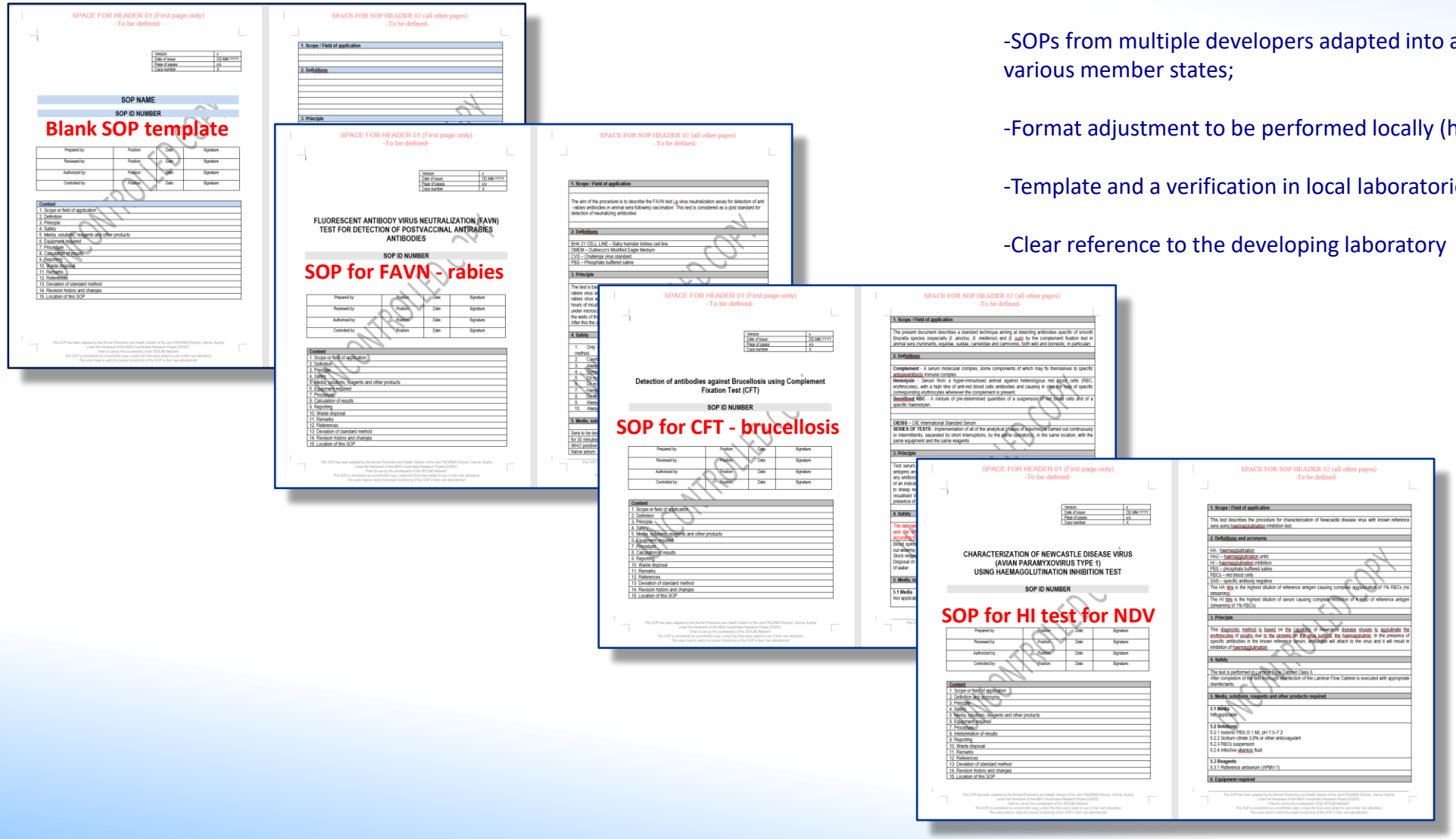
Attachments to each SOP
OS-L=Original SOP, long version
OS-S=Original SOP, short version
AS-L=Adapted SOP, long version
AL-S=Adapted SOP, short version
SR=Source reference
Number of attachments present

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

iVetNet Information Platform – One Stop Shop for Information Sharing

SOPs for ASF

Institutions | Feedback

Parameter Information

Parameter Type: Animal disease

Parameter: African Swine Fever

Show Local Techniques

Show parameters for selected type

Search

Institutions | Further reading | Recommended techniques

SOP ID	Source Institution	Source Insti...	Source Institu...	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 Africal 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		3	0	2	2	0

1 2 3 10

11 - 20 of 24 items

24 SOPs for ASF

Categorized by type of technique

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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)"

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

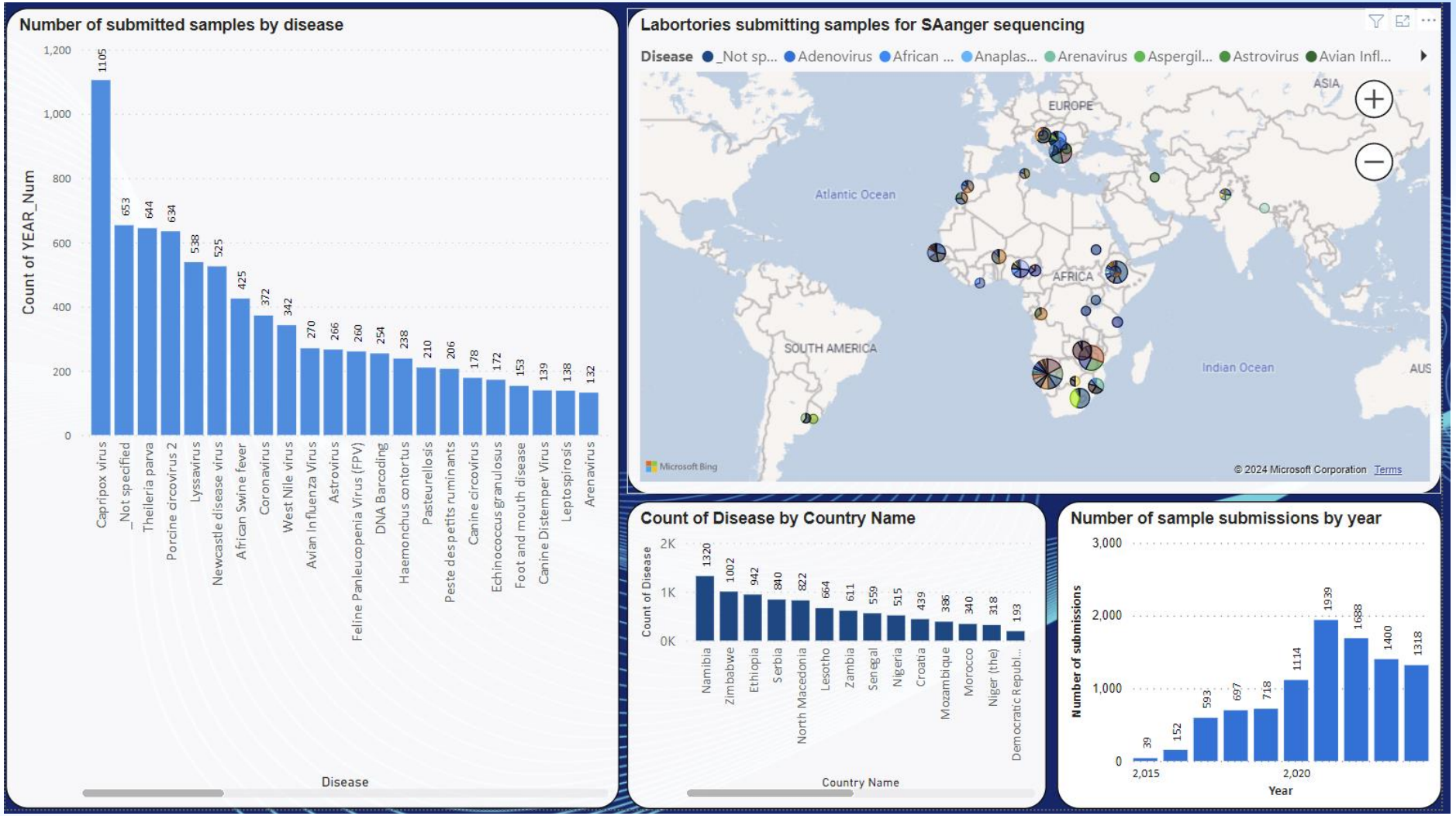
Content
1. Scope or field of application
2. Definition/Acronyms
3. Principle/Background information
4. Safety
5. Media, solutions, reagents and other products
6. Equipment required

Large portion in SOPs in ISO 17025 compatible format

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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

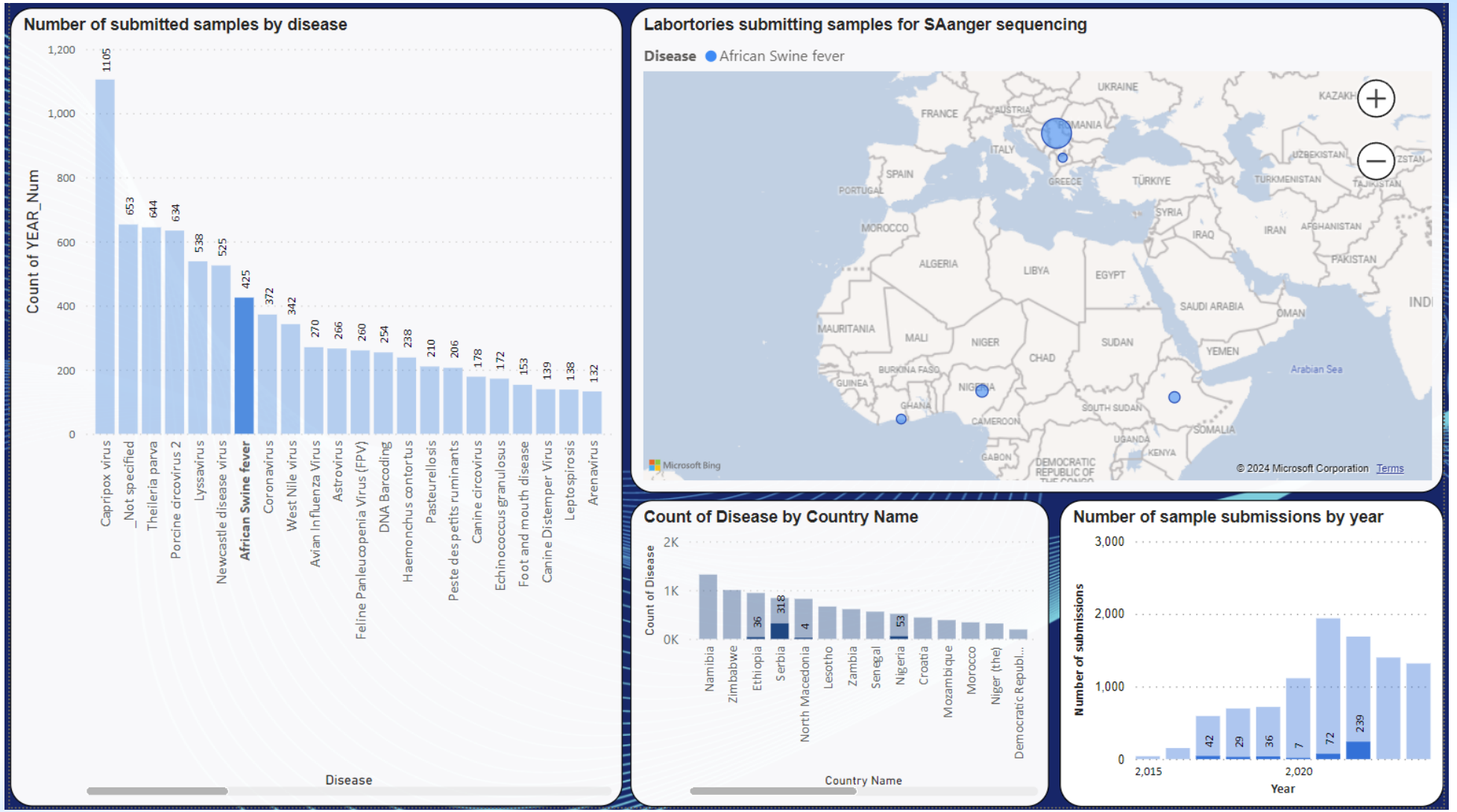
-61 publications / 54 in peer reviewed journals.

Joint FAO/IAEA Centre

Nuclear Techniques in Food and Agriculture

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

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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

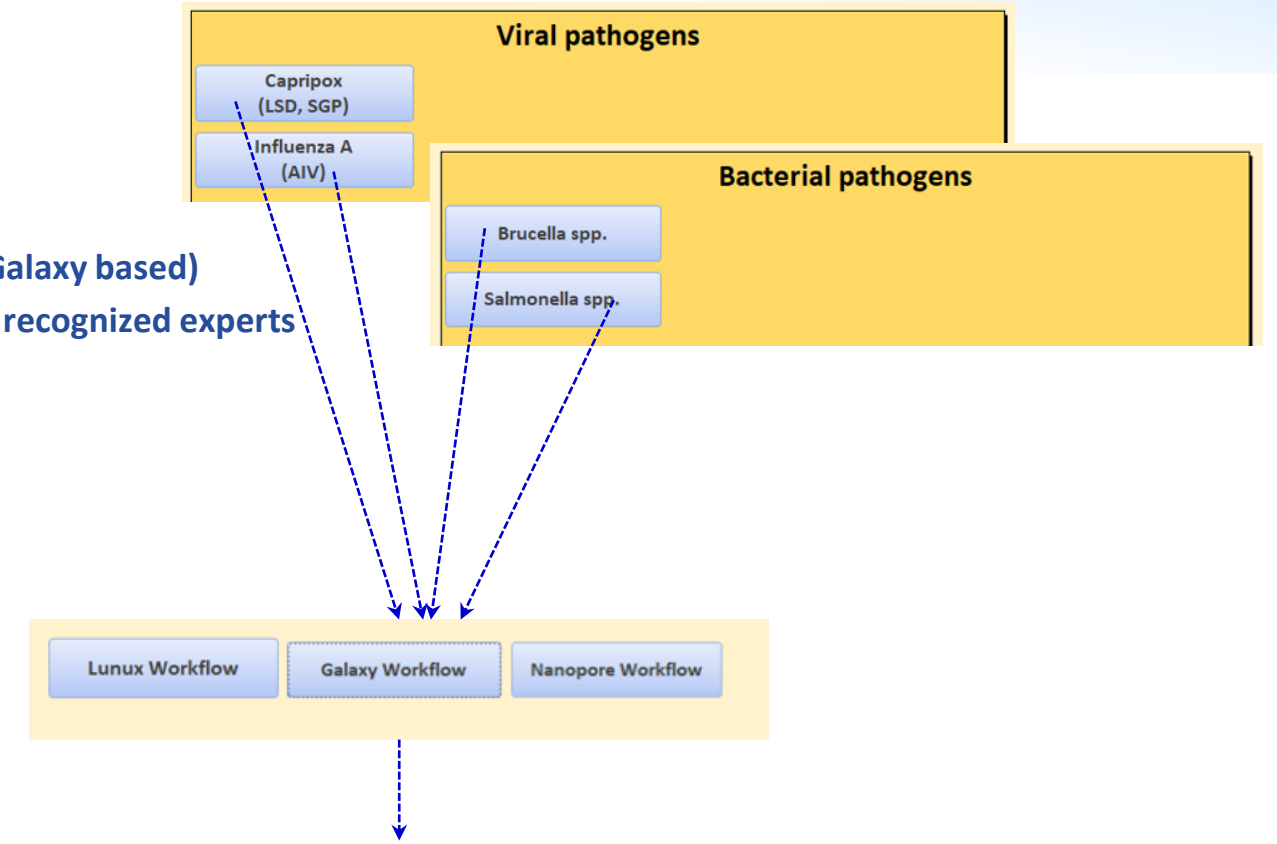
-Instructions for sample prep up to bioinformatics (Linux based and Galaxy based)

-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

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

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.*

Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture


Optimizing the
efficient utilization
of available feed
resources

Thank You !