FINAL REPORT

MEETING OF ANIMAL HEALTH LABORATORIES OF THE COUNTRIES OF THE COSALFA - SOUTH AMERICAN COMMISSION FOR THE FIGHT AGAINST FOOT-AND-MOUTH DISEASE -

Rio de Janeiro | 10 - 12 December 2024

The purpose of this report is to outline the key topics that were addressed and discussed during the three-day meeting, the decisions adopted and the resulting recommendations.

This event was convened to bring together the heads/directors of animal health laboratories of COSALFA member countries involved in the diagnosis of vesicular diseases in order to exchange experiences, discuss achievements and challenges in diagnosing priority diseases that could be confounded with foot-and-mouth disease (FMD), identifying strengths and gaps as well as the need for technical cooperation.

On this occasion, a discussion was also held to get to know and identify the current needs of laboratories regarding other animal diseases of public health importance with a view to strengthening regional technical cooperation.

The meeting methodology included a presentation of the results of previously gathered relevant information on the capacities of the laboratories of the 13 COSALFA member countries, followed by strategic technical presentations that included plenary discussions and group work. Annex 1. Agenda of the meeting.

The meeting was attended by a total of 30 participants from 11 countries of the region and professionals from the Pan American Center for Foot-and-Mouth Disease and Veterinary Public Health (PANAFTOSA/VPH-PAHO/WHO) as well as the Health Emergencies Department (PHE) of the Pan American Health Organization (PAHO), and the Ministério da Agricultura e Pecuária of Brazil (MAPA). Annex 2. List of participants.

GENERAL OBJECTIVES OF THE MEETING

- Strengthening the regional system of foot-and-mouth disease and animal health laboratories of COSALFA member countries;
- Promoting the exchange of knowledge and experiences among the countries to facilitate regional cooperation links;
- Identifying and elaborating recommendations to promote technical cooperation and improvements in laboratory quality management processes for the diagnosis of animal diseases;
- Identifying PANAFTOSA/VPH technical cooperation priority actions to strengthen the regional system of national animal health laboratories in the countries of the region.

SUMMARY OF DAY 1 | December 10, 2024

Dr. Ottorino Cosivi, the PANAFTOSA/VPH director, opened the meeting with a welcome message to the participants, highlighting the importance of cooperation between laboratories as a key strategy to strengthen the animal health system. He further underlined that the driving force of this laboratory meeting was grounded in the success and the experience gained from other similar initiatives led by PANAFTOSA/VPH.

Afterwards, Dr. Euclides De la Torre, coordinator of PANAFTOSA/VPH laboratory, presented the meeting agenda, invited the participants to introduce themselves and pointed out some key matters such as the need of joint work between laboratories and field teams, the importance of cooperation between the animal and human health areas, and the opportunity for technical cooperation support from PANAFTOSA/VPH to respond to the demands of each country, reinforcing the commitment with veterinary public health in the countries within the regional context. The day's technical agenda started with two thematic sessions presented by PANAFTOSA/VPH followed by activities with discussions in working groups.

Session 1: Foot-and-mouth disease and other vesicular diseases in the Americas

1.1 Current context of FMD epidemiological situation in the region

Diego Viali, Foot-and-mouth disease coordinator, PANAFTOSA/VPH-PAHO/WHO

Dr. Diego Viali highlighted the role of PANAFTOSA/VPH as reference center for the eradication of FMD, with a special focus on laboratory diagnosis, quality control and technical cooperation.

He emphasized the coordination of the Action Plan 2021-2025 of the Hemispheric Program for the Eradication of Foot-and-Mouth Disease (PHEFA) and PAHO's governance mechanisms in the region – such as the Hemispheric Committee for the Eradication of Foot-and-Mouth Disease (COHEFA) and the South American Commission for the Fight against Foot-and-Mouth Disease (COSALFA) – as essential strategies for the fight against the disease and regional integration. Significant improvements in eradications have been made in the Americas.

1.2 The role of PANAFTOSA/VPH-PAHO/WHO's reference laboratory and the technical cooperation to the countries

Maristela Pituco, Reference laboratory, PANAFTOSA/VPH-PAHO/WHO

Dr. Maristela Pituco underlined the importance of PANAFTOSA/VPH's role and technical cooperation for the improvement of processes and the integration between national laboratories to enhance surveillance, control and eradication of foot-and-mouth disease and other vesicular diseases.

She remarked that WOAH's Reference Laboratory for foot-and-mouth disease works to promote validated and standardized diagnostic methods, ensuring the quality and reliability of results through proficiency tests and training. Additionally, the laboratory provides technical cooperation and scientific support by developing reagents and innovative diagnostic methodologies, contributing to rapid emergency detection and response.

Data was presented on surveillance and monitoring efforts, particularly the differential diagnosis between foot-and-mouth disease and other vesicular diseases such as vesicular stomatitis and Senecavirus, as well as on genomic research to track viral circulation patterns. The meeting also discussed historical phylogenetic studies that contribute key information to understanding virus evolution and to prepare containment strategies.

Dr. Pituco highlighted the importance of regional and international cooperation, remarking the need to align quality standards, as well as the implementation of ISO/IEC 17025 Standard in national laboratories, in addition to the continuous training of professionals. These actions seek to enhance an integrated response based on the "One Health" approach to ensure animal health and protect and promote public health in the Americas.

Lastly, she emphasized PANAFTOSA/VPH's ongoing commitment in supporting COSALFA member countries and PAHO's for foot-and-mouth disease eradication, promoting knowledge sharing, technology development and technical missions to increase diagnostic capacities and regional strategies for health control.

DISCUSSION

Following the presentations, a space for discussion and clarification of doubts was provided, enhancing the dialogue on critical topics for the laboratories of the region. Dr. Alfonso García, representative of Chile, highlighted the scope of PANAFTOSA/VPH's role beyond foot-and-mouth disease diagnosis, underlining its serological and molecular support for other diseases such as glanders, influenza and equine encephalitis which, for instance, has behaved as a transboundary disease. He remarked on the success of the initiatives implemented and the importance of expanding laboratory technical cooperation to new areas.

Among the topics addressed, particular emphasis was given to the challenges concerning quality of metagenomic studies, such as the neatness to recover the target virus with good quality, data analysis using bioinformatics, and methodology standardization. The need to enhance technical cooperation between PANAFTOSA/VPH and the countries with reference to metagenomic testing was underscored. Dr. Ana Garrido, representative of Ecuador, mentioned brucellosis and highly pathogenic influenza as diseases of interest for metagenomic studies. Dr. Anselmo Rivetti, representative of Brazil, suggested that PANAFTOSA/VPH could support training in bioinformatics and the creation of a regional databank. Dr. Juliana Leite, from PAHO, and member of *PAHOGen*, mentioned that the network provides specialized education in bioinformatics and offered her support for this demand. The discussions emphasized PANAFTOSA/VPH's strategic role as a catalyst for technical training and regional integration, contributing to the strengthening of diagnostic capacities and advancing veterinary public health in the Americas.

Finally, Dr. Nancy Naranjo, representative of Colombia, stressed the need for PANAFTOSA/VPH to obtain accreditation to ISO/IEC 17043, pointing out that this requirement has been mandated by the regulatory bodies in her country.

Session 2: Situation of animal health laboratories in COSALFA countries

2.1 Presentation and analysis of the results of COSALFA laboratory survey

Euclides De la Torre, Reference laboratory, PANAFTOSA/VPH-PAHO/WHO

A large study conducted by the Pan American Health Organization (PAHO) and PANAFTOSA/VPH laboratory, jointly with the laboratories of COSALFA member countries, consisting of a survey, revealed major challenges and pointed out priorities to strengthen the regional network of animal health laboratories.

The survey results highlighted the urgent need to reinforce biosafety measures, particularly in Biosafety Level 1 (BSL-1) laboratories or those that have not yet implemented good practices. Besides, it showed the diversity in diagnostic methodologies, which may hamper standardization and result comparison.

An additional critical issue identified was the lack of contingency plans for addressing emerging diseases in the laboratories of many countries, which hinders the response to unexpected events. Although many countries invest in modern equipment, the study shows the need to increase investment in technologies that improve data communication and analysis. The survey also revealed gaps in the continuous training of technical staff for the standardization of diagnostic methods, which compromises the quality of laboratory services.

Given this scenario, the study concluded that risk management and technical training are priority issues to strengthen the regional network of animal health laboratories. Besides, the result remarks the importance of overcoming challenges such as the difficult access to certified reference materials and the integration of PCR in diagnostic algorithms. The study ratifies the importance of collaboration between COSALFA member countries and PANAFTOSA/VPH's technical cooperation to overcome the challenges identified and strengthen the regional network of animal health laboratories.

Summing up, the analysis of the survey results highlights the urgent need for coordinated actions to strengthen the network of COSALFA animal health laboratories, investing in biosecurity, communication technologies and data analysis, technical training and risk management. Intercountry collaboration and international technical cooperation are essential to ensure the quality of animal health laboratory services and protect public health in the region.

DISCUSSION

One of the substantial matters raised was the need to harmonize the guidelines for the shipment of biological materials. The complexity and variations in procedures between countries represent a significant obstacle for regional cooperation. The bureaucracy associated with imports of biological materials was an additional issue addressed. The suggestion to implement import permits with a longer validity period, in line with European practices, was very well received. This measure could accelerate processes and reduce operational costs. Dr. Juliana Leite reported that PAHO is planning to provide training under the guidelines of the International Air Transport Association (IATA) for the next year. This is a crucial initiative to ensure that professionals in the sector stay up to date with best practices for the safe transportation of biological materials.

Dr. Johaine Ekeema Mc Allister, representative of Guyana, requested technical support for the implementation of ISO/IEC 17025 Standard, showing interest in reinforcing their quality management systems.

The shortage of proper reference materials hinders full validation of many tests such as *ELISA FMD gIII multispecies*, produced by PANAFTOSA/VPH, which requires positive pig samples to complement its validation. The representative of Argentina proposed collaborating with pig, sheep and goat samples to help in this process. This initiative proves the potential of technical cooperation to overcome the difficulties faced by the countries in the region.

GROUP ACTIVITY

For this activity, participants were divided into three working groups, each of them accompanied by a representative of PANAFTOSA/VPH who encouraged and oriented the discussion toward:

1) harmonization of diagnostic algorithms;

2) risk analysis at laboratory level; and

3) quality management system.

After the discussion, each group presented a topic randomly chosen, delivering the following results:

GROUP 1 » Harmonization of foot-and-mouth disease diagnostic algorithm

In order to establish a uniform and effective diagnostic protocol, group 1 presented a detailed algorithm considering the different epidemiological realities of participating countries.

The initial proposal suggested a differentiated approach for serum samples based on vaccination coverage in the region. In areas with high vaccination coverage, initial detection would be carried out using non-structural protein ELISA followed by indirect immunoenzymatic assays (EITB). In regions with low vaccination coverage, structural protein ELISA would be enough for initial detection. For other types of samples, such as epithelium, vesicular fluid and cerebrospinal fluid (CSF), the algorithm proposed a sequence of tests including viral antigen ELISA, PCR, virus isolation, genome sequencing and differential diagnoses (refer to annex 3).

However, during the discussions, participants provided several suggestions and experiences that would enrich the proposed algorithm. For instance, carrying out typing ELISA and PCR simultaneously to optimize diagnostic time. Furthermore, the importance of genome sequencing for virus characterization was widely recognized.

Dr. Alfonso García, representative of Chile, an FMD-free country without vaccination, suggested a specific algorithm for their status using diagnostic methods based on the detection of non-structural proteins. This suggestion showed the need to adapt the algorithm to the particular needs of each health status.

Regarding the diagnostic methods used for confirmation, some discussed how to reorganize this algorithm, while others suggested that PCR could replace antigen ELISA as the initial test. The inclusion of clinical criteria into the algorithm was also considered essential for the interpretation of laboratory results. Dr. Nancy Naranjo Amaya, representative of Colombia, proposed the creation of a reagent bank to ensure the access to essential supplies in emergency situations.

Discussions regarding the diagnostic algorithm showed the need for a flexible approach that can be adapted to different epidemiological and laboratory realities of the participating countries. The creation of a single protocol taking into account the different suggestions made will allow to optimize virus detection and characterization, thus contributing to disease control and prevention.

GROUP 2 » Laboratory risk analysis

Group 2 presented its vision of the risk analysis in laboratories manipulating FMD suspected samples. Participants agreed that biosafety level 2 (BSL-2) is the minimum level to carry out techniques such as

molecular biology and serology, but they maintained that FMDV would ideally be handled at biosafety level 3 Plus (BSL-3 Plus), which allows virus isolation and neutralization, providing greater safety for professionals and the environment. When discussing the main risks associated with these laboratories, participants underscored the possibility of viral escape during equipment maintenance, the threat of bioterrorism, the difficulties to procure reagents, the challenges in gaining laboratory accreditation, staff turnover and professionals' lack of training. Furthermore, the lack of information systems and robust data was identified as a significant risk factor.

In order to analyze the risk of animal and human exposure, the group recommended the adoption of prevention strategies and the use of specific tools, such as risk analysis (methodology-agent). This approach allows the systematic evaluation of risks associated with each stage of the laboratory process.

Regarding contingency plans, participants highlighted the importance of drafting these documents clearly and in detail, describing the procedures to be adopted in the case of an incident.

Concerning cooperation proposals with PANAFTOSA/VPH, the following were suggested: providing advice to define the appropriate biosafety level for each laboratory and the implementation of improvement measures; delivering training courses in risk analysis; performing risk analyses every six months; and elaborating a model contingency plan that can serve as the basis for the countries of the region.

During the discussions, the representatives of Chile and Brazil shared their experiences with commercial or non-commercial risk assessment platforms, such as BioAMR 2.0.

Participants highlighted the need of training and support for the implementation of risk assessment systems in their laboratories.

GROUP 3 » Quality management system

Group 3 gave a presentation on the importance of quality management systems in diagnostic laboratories, emphasizing the importance of accreditation according to international standards such as ISO/IEC.

Participants agreed that laboratory accreditation is essential to ensure result reliability and institutional credibility. In this sense, the ISO/IEC 17025 Standard emerges as a fundamental pillar, as it establishes strict requirements for the technical competence of testing and calibration laboratories. By complying with ISO/IEC 17025 Standard, a laboratory demonstrates its capacity to produce precise, accurate and traceable results.

In addition to ISO/IEC 17025 Standard, ISO 17034 Standard was underlined as an essential element to ensure the quality and reliability of the reference materials provided. Accreditation under this standard guarantees that reference materials are produced and characterized according to international standards, which contributes to the comparability of results between different laboratories.

It was also pointed out that to comply with the requirements of accreditation bodies, it is necessary that proficiency tests be organized by suppliers accredited under the ISO/IEC 17043 Standard.

SUMMARY OF DAY 2 | 11 December 2024

Following with the meeting's agenda, on the second day all participants visited PANAFTOSA/VPH headquarters, located in Duque de Caxias, RJ, to get to know its facilities and the new BSL-3-Plus reference laboratory. On this occasion, each technical area of PANAFTOSA/VPH presented its role and the main technical cooperation activities offered to the countries of the region, as well as other aspects considered relevant to PAHO's work on the matter.

The topics presented are described below.

FOOT-AND-MOUTH DISEASE

Diego Viali, Foot-and-mouth disease area, PANAFTOSA/VPH-PAHO/WHO

Dr. Diego Viali highlighted that PANAFTOSA/VPH plays a highly significant role in FMD eradication and control in South America. Some of its activities include technical strengthening, coordination of health strategies and risk management in order to eliminate virus circulation and mitigate the health and economic impacts of the disease. PANAFTOSA/VPH's work is based on four main axes: the first comprises the strengthening of technical capacities and emergency preparedness by developing diagnostic kits, laboratory techniques and quality control of vaccines. Moreover, handbooks, technical guides and contingency plans adapted to local needs are elaborated, and teams are trained on emergencies by delivering training and field drills. The second axis consists of PAHO governance mechanisms for FMD technical cooperation, among them, the Hemispheric Committee for the Eradication of Foot-and-Mouth Disease (COHEFA) and the South American Commission for the Fight against Foot-and-Mouth Disease (COSALFA). Dr. Viali also highlighted the coordination of the Plan of Action 2021-2025 of the Hemispheric Program for the Eradication of Foot-and-Mouth Disease (PHEFA), in the American continent, for health strategies and support to strengthening national capacities, strategic planning and monitoring, which comprise the third axis for foot-and-mouth disease eradication in the region. Activities such as evaluation of national control programs, legal and technical reviews, adaptation of emergency management programs, risk analysis of virus introduction, and development of integrated biosafety, surveillance, communication and operative continuity plans are carried out. And the fourth axis is focused on sustainability initiatives and associations. At the countries' request, PANAFTOSA/VPH is coordinating the creation of a regional antigen and vaccine bank (BANVACO) for the region for a rapid response to outbreaks in the countries, promoting international collaborations and cooperation funding instruments such as the PHEFA Trust Bank and the Cooperation Agreements with the countries.

Currently, the PHEFA establishes three main objectives: eradiating the virus in Venezuela and mitigating risks in the Northern Andean subregion; supporting in the transition of the countries to the FMD-free status without vaccination by prioritizing field actions and epidemiological studies; and maintaining the health status in already FMD-free territories by strengthening surveillance and prevention systems.

ZOONOSIS

Marco Vigilato, PANAFTOSA/VPH-PAHO/WHO zoonosis area

Consistent with its mission of protecting public and animal health in the Americas, PANAFTOSA/VPH plays a key role as a technical cooperation platform aimed at addressing zoonotic diseases. Integrating the efforts of the 35 PAHO/WHO member countries, the organization stands out for strengthening technical capacities, intersectoral governance, knowledge building and production of essential supplies to face the health challenges posed by these diseases.

Some of its priority areas of action are the fight against dog and wildlife rabies, based on the governance mechanism of technical cooperation with the Meeting of Rabies Program Directors of the Americas (REDIPRA), with over 40 years of history in regional coordination. Since its first meeting in 1983 in Guayaquil, Ecuador, REDIPRA has promoted harmonized health policies and strategies for the eradication of rabies both in animals and humans. Besides, control of cystic echinococcosis, also known as hydatidosis, is carried out in the framework of the Regional Program 2020-2029 for the Elimination of Cystic Echinococcosis. This program promotes preventive and surveillance actions as well as good practices for disease management, contributing notably to reducing its impact on public health.

Another highlight is the work with venomous animals and antivenoms, where PANAFTOSA/VPH leads the Latin American Network of Public Antivenom Manufacturing Laboratories (RELAPA) since 2018. This network has strengthened the regional technical capacity for antivenom production and distribution, promoting training, technical meetings and the link between national authorities. These efforts have resulted in greater availability and quality of these supplies, crucial for saving lives in cases of envenomation.

PANAFTOSA/VPH technical work comprises extensive actions for the elaboration of technical guides and professional training. With courses, webinars and specialized training, the organization aims to qualifying national teams, strengthening local management capacity and emergency response. This knowledge dissemination is essential for the consolidation of national networks of technical collaboration, promoting data sharing and improvements to address zoonotic diseases.

The integrated and sustainable approach adopted by PANAFTOSA/VPH shows a permanent commitment with the promotion of public and animal health. By consolidating cooperation networks, supporting local production of supplies and harmonizing regional strategies, the organization contributes to a more resilient and prepared system to address the challenges posed by zoonotic diseases. This evidence-based approach reinforces the key role of technical cooperation for the strengthening of public health, protecting both human and animal populations in the Americas.

FOOD SAFETY

Jônathas Vieira, PANAFTOSA/VPH-PAHO/WHO food safety area

PANAFTOSA/VPH technical cooperation in Food Safety plays a key role for the strengthening of food security in the Americas and it focusses on strengthening food regulation and surveillance systems, including risk-based inspection, scientific assessment of hazards and integrated management. One of the main highlights is the coordination of the Inter-American Network of Food Analysis Laboratories (INFAL), created in 1977 as a result of an agreement between Member States and international organizations with the purpose of strengthening technical and scientific capacities of food analysis laboratories in the region, promoting public health, and facilitating regional trade. Acting as a South-South technical cooperation mechanism, the initiative seeks to protect consumers' health by means of collaboration and interaction between laboratories within the framework of integrated national programs for food protection.

INFAL gathers 178 laboratories from 25 countries, 58% of which are accredited under the ISO/IEC 17025 Standard, which ensures high quality levels in their processes. Its work is oriented by a risk management approach, from laboratory tests to integrated surveillance of foodborne diseases (FBD) and antimicrobial resistance (AMR). Additionally, INFAL plays a key role in the coordination of these activities, promoting training, proficiency tests and dissemination of technical documents. By means of workshops, training and technical assistance, INFAL improves technical and scientific competence of laboratory teams and fosters the implementation of national action plans.

These efforts are performed in line with the *Codex Alimentarius* standards, whose national programs count with the financial support of trust funds from different countries. On the other hand, capacity building in traditional food markets and the implementation of good production and handling practices reinforce the commitment with food security, from the farm to the table.

The fight against AMR is also a priority strategy addressed through integrated molecular surveillance and specific action plans to control and mitigate this emerging problem. Communication and education have been fundamental tools to expand the scope of actions, including the elaboration of educational material, training and campaigns such as the World Food Safety Day.

To sum up, technical cooperation in Food Safety reveals a solid commitment with public health. By promoting the strengthening of laboratory and regulatory capacities, harmonizing standards and disseminating good practices, PAHO/WHO ensures the protection of consumers' health and fosters a safer and resistant food system.

EPIDEMIOLOGY

Lia Buzanovsky, PANAFTOSA/VPH-PAHO/WHO epidemiology area

Technical cooperation in epidemiology is focused on strengthening actions in an integrated approach with other work areas, including foot-and-mouth disease, laboratories, zoonotic diseases and food safety, and with PAHO's Health Emergency Department (PHE) in topics such as zoonotic influenza and the International Health Regulations, in addition to developing risk-based surveillance systems.

It acts as a crucial axis for the development and application of tools that support surveillance, risk analysis and animal health emergency response, including the design of epidemiological and laboratory studies, modelling the transmission of diseases such as foot-and-mouth disease and brucellosis, as well as data analysis using epidemiological indicators and geographic information systems (GISs), and promoting courses and training for surveillance, emergency management and the use of GIS tools.

Technical support with PANAFTOSA/VPH reference laboratory includes kit validation, quality control, development of state-of-the art techniques such as ELISA FMD gIII for foot-and-mouth disease and BKM16 for glanders, as well as interlaboratory rounds to ensure high levels of technical performance.

Likewise, in emergency situations in the region, direct support is offered to the countries, assisting in decision making, risk characterization, epidemiological data management and containment strategies such as vaccination, slaughter of infected animals and safe disposal of carcasses. These actions are performed in line with reference laboratories and in collaboration with international organizations such as the Inter American Institute for Cooperation on Agriculture (IICA), the World Organisation for Animal Health (WOAH), the Food and Agriculture Organization of the United Nations (FAO), the International Regional Organization for Plant and Animal Health (OIRSA) and the USDA's Animal and Plan Inspection Service (APHIS).

Information systems were also developed for surveillance and health management, such as the Interface for Official Veterinary Surveillance (IVVO), intended for the surveillance of the official veterinary sector, and IVVO PET, for managing the surveillance of companion animals, including diseases such as canine visceral leishmaniosis, which represent significant milestones for integrated monitoring and rapid response to outbreaks.

Avian influenza has been a priority objective, particularly in regions of backyard poultry farming, with a higher risk of transmission, where the efforts are focused on reviewing and applying contingency plans, conducting risk-based surveillance and supporting WOAH's reference laboratory for the diagnosis of avian influenza, corresponding to the Federal Agricultural Defense Laboratory, Sao Paulo (LFDA-SP), of the Ministry of Agriculture, Livestock and Food Supply (MAPA) of Brazil. It also promotes information sharing and good practices between countries, strengthening the regional coordinated response for outbreak containment and risk mitigation.

The work is aligned with the One Health principles, recognizing the interconnection between animal, human and environmental health. By means of intersectoral commissions and regional consultations, it seeks to consolidate collaboration actions for the surveillance and control of zoonotic diseases, promoting an integrated response encompassing the ministries of health, agriculture and environment of the countries, as well as strategic partners.

In summary, the activities stand out for its direct impact on public and animal health by promoting collaborative and innovative work which combines scientific rigor, technology and capacity development. These efforts contribute to building resilient and sustainable surveillance systems, essential to address the health challenges of the Americas in an integrated and effective manner.

LABORATORY

Euclides De la Torre, Reference Laboratory, PANAFTOSA/VPH-PAHO/WHO

Dr. Euclides De la Torre emphasized that PANAFTOSA/VPH Laboratory plays a strategic role in strengthening animal health in the Americas, and stands out in the development of diagnostic tools and control of FMD vaccines. Since its foundation, the laboratory has been devoted to technical innovation and capacity building in the countries of the region, becoming a reference for the diagnosis of animal diseases and the support provided to eradication programs. PANAFTOSA/VPH laboratory is recognized by WOAH as FMD Reference Laboratory.

One of its main achievements is the development of the immunological technique ELISA, which demonstrated to be more specific and sensitive to identify the FMD virus than traditional methods. This technique not only improved diagnosis but also harmonized laboratory processes in the entire region, with a significant contribution to the collective efforts for FMD eradication. Additionally, the laboratory led the implementation of ELISA-CFL in 1995, a technique widely used by the countries to control the potency of FMD vaccines, ensuring greater efficacy of immunization programs.

Over the years, the Laboratory has expanded its activities, incorporating new technologies and developing diagnostic kits for other relevant diseases in the region, such as glanders. The continuous commitment with technical improvement can be observed in the creation of cutting-edge diagnostic tools that support epidemiological studies and differentiate diseases that share clinical symptoms similar to those of foot-and-mouth disease. This approach enables countries to address health challenges more precisely and effectively, consolidating their surveillance systems.

With modern facilities in Pedro Leopoldo and Duque de Caxias, Brazil, the laboratory is devoted to the production of reference materials and specialized diagnoses, acting as a crucial support for the regional animal health community. This avant-garde infrastructure, combined with a highly qualified technical team, enables the laboratory to meet the increasing demands of member countries, promoting local technical capacity and knowledge sharing.

Dr. Euclides De la Torre restated the commitment with the countries of the Americas, keeping the focus on improving diagnostic capacities and strengthening surveillance systems. Its mission remains oriented toward the promotion and protection of public and animal health, in line with the objectives of eradicating FMD and other relevant diseases in the region. With a history marked by innovation and international collaboration, the laboratory cooperation stands as an essential landmark in advancing One Health and promoting sustainable development in the region of the Americas.

Following the presentation of PANAFTOSA/VPH technical areas, Dr. Juliana Leite from PAHO, Dr. Dilmara Reischak from the Federal Laboratory of Agricultural Defense of São Paulo (LFDA-SP) of the MAPA, Brazil, and Dr. Patricia Aguilar from the US Center for Tropical Diseases, University of Texas Medical Branch, were invited to talk about their areas of activity and present other relevant topics for the region.

DISEASES WITH PANDEMIC POTENTIAL

Juliana Leite, PAHO's Health Emergency Department (PHE)

Public health laboratories play a key role in PAHO's technical cooperation, integrating actions for surveillance, early detection and response to health emergencies, according to the One Health principles. With an interdisciplinary approach, laboratories not only survey endemic pathogens but they also are prepared to identify and characterize new agents with epidemic potential. This response capacity is possible through a robust network of national and regional laboratories that work jointly with WHO collaborating centers and are supported by advanced quality management systems.

PAHO's core strategy is the permanent strengthening of the laboratory surveillance and response platform. This includes the development of quality management systems, technical training, implementation of biosafety and biosecurity policies and the provision of critical materials such as antigens, conjugates, PCR kits, and enzymes. These actions guarantee not only the procurement of supplies but also the full implementation of integrated strategies involving training and specific programs to guarantee the quality and efficiency of laboratory processes.

In the context of virological surveillance, the role of laboratories extends to include characterization of respiratory viruses such as influenza. By means of genomic surveillance, initiatives such as the Respiratory Virus Genomic Surveillance Regional Network (RESVIGEN) allow to make more informed decisions on public health, including the composition of influenza vaccines. Laboratories also contribute to sample shipment and analysis under international standards, collaborating with reference centers such as the US Centers for Disease Control and Prevention (CDC) and the St. Jude Children's Research Hospital, University of Tennessee, WHO Collaborating Centre for Studies on the Ecology of Influenza in Animals for the identification of viruses with pandemic potential, and promoting the exchange of genomic and antigenic data.

PAHO stresses the relevance of the integration between national public and animal health laboratories, national networks, and regional reference laboratories, promoting a collaborative and sustainable approach. This integration is crucial to ensure early detection and effective surveillance, the essential pillars for the protection of world health. PAHO's strategy also includes continuous assessment of laboratory capacities and gap identification jointly with technical assistance and the development of guidelines to improve emergency response.

The networking promoted by PAHO goes beyond the limits of laboratories and also includes training teams for the shipment of infectious substances, handling of critical materials and complying with international standards such as those established by the IATA. This integrated approach reflects the organization's commitment to strengthen the capacity of member countries to effectively respond to health crises.

In conclusion, the strengthening of laboratory capacities together with integrated surveillance and strategic planning from the One Health perspective prepares the countries of the region to address future pandemics with improved preparedness and efficiency. This coordinated effort restates the key role of laboratories in the promotion of public health and the protection of global health.

AVIAN INFLUENZA

Dilmara Reischak, LFDA/SP, MAPA, Brazil

Technical cooperation between PANAFTOSA/VPH and national reference laboratories of the region plays a key role in strengthening diagnostic capacities for avian influenza. Through coordinated efforts and strategic actions, the initiative aims not only to improve diagnostic precision but also to promote integration between laboratories and regional and global networks, consolidating a collaborative and efficient approach for the surveillance and control of these diseases.

The LFDA-SP, WOAH's reference laboratory for avian influenza and Newcastle disease, is a key player in this technical cooperation. Its mission includes the development of technical capacities in national reference laboratories by delivering interlaboratory tests, training, and promotion of cutting-edge methods of proficiency panels production and evaluation. These actions reinforce trust at intra- and interinstitutional level, ensuring the quality and standardization of diagnoses in the entire region.

One of the key initiatives is the South American Network for Avian Influenza and Newcastle Disease (RESUDIA), a network consolidated over ten years that encourages the exchange of technical knowledge between participating countries. The program promotes not only regional integration but also international collaborations such as those with the USDA National Veterinary Service Laboratories (NVSL) in the USA. These collaborations are critical to ensure the ongoing update of methods and training of specialized human resources in reference laboratories.

Furthermore, the commitment of professionals with continuous training is a key aspect of the strategy. Through capacity building, workshops, and interlaboratory tests, participating laboratories receive training in molecular diagnostic techniques, such as viral RNA detection by RT-qPCR. This approach not only enhances the technical level of the institutions involved but also ensures that they are prepared to respond effectively to outbreaks of significant health relevance.

The expansion of the RESUDIA and the strengthening of reference laboratories' capacities reflect PANAFTOSA/VPH commitment with the promotion of animal health and the protection of public health in the region of the Americas. By adopting an integrated approach that combines scientific innovation, technical training and international collaboration, technical cooperation contributes to create robust and resistant surveillance systems capable of addressing the challenges posed by emerging and reemerging diseases.

Summing up, collaborative work between PANAFTOSA/VPH and national animal health reference laboratories strengthens the scientific and operational foundation required to protect human and animal populations, promoting sustainable development and health safety worldwide.

EQUINE ENCEPHALITIS

Patricia Aguilar, Center for Tropical Diseases, University of Texas Medical Branch

Equine encephalitis, including Venezuelan equine encephalitis (VEEV), Eastern equine encephalitis (EEEV) and Western equine encephalitis (WEEV), represent a significant challenge for animal and public health in Latin America and other endemic regions. These arboviruses, transmitted by mosquitoes such as *Culex, Ochlerotatus* and *Psorophora*, exhibit complex transmission cycles involving intermediate hosts such as birds and small rodents, as well as terminal hosts such as horses and humans. In addition to being highly fatal in horses, equine encephalitis has significant economic and health consequences, thus requiring robust surveillance, diagnostic and control strategies to minimize its impact.

The PROTECT project, an integrated and multi-institutional initiative funded by the Pandemic Fund and led by PAHO, including PANAFTOSA/VPH, aims to develop and implement standardized tools for the diagnosis, surveillance and response to equine encephalitis. Countries such as Brazil, Bolivia, Chile, Colombia, Ecuador, Paraguay and Uruguay participate in this joint effort that seeks to optimize the capacities of animal health services for early outbreak detection and containment. Some of the project's main objectives are the harmonization of diagnostic methods, the strengthening of epidemiological surveillance, and the improved access to essential laboratory resources.

The history of equine encephalitis studies is marked by the contribution of institutions such as the World Reference Center for Emerging Viruses and Arboviruses (WRCEVA), which leads the research on arbovirus distribution and epidemiology since 1953. The WRCEVA, currently based in the University of Texas, keeps a collection of over 8,000 viral strains and offers technical support for the characterization of new viruses, scientific training and response to outbreaks. This experience is crucial to improving the understanding of evolutionary and transmission mechanisms of these pathogens.

In spite of the technological and scientific progress, the countries of the region face significant challenges in equine encephalitis surveillance and control. The lack of harmonization in the use of diagnostic methods between regional laboratories hinders a coordinated response to outbreaks. These challenges are exacerbated by the need for early case detection, a critical factor to contain transmission and reduce the health and economic impact of epidemics.

In summary, the PROTECT project and the coordinated efforts related to equine encephalitis represent a crucial step toward the construction of more resistant health systems prepared to face the challenges of emerging zoonotic diseases. By linking science, international collaboration and technical training, these initiatives contribute to the protection of public and animal health, promoting the wellbeing of populations and a sustainable development in the region of the Americas.

By the end of the morning, participants had the opportunity to visit PANAFTOSA/VPH facilities. This visit gave them a deeper insight into the structure and available resources to carry out technical cooperation activities, further reinforcing the collaboration links between the organization and its member countries.

During the debates, participants were briefed on the scope of the technical cooperation provided by PANAFTOSA/VPH, which involves all the relevant aspects of laboratory analyses in support of animal health programs and professional training. These presentations provided the foundation for discussing each country's specific needs and prepared the participants for the group activities scheduled for the third day of the meeting.

SUMMARY OF DAY 3 | December 12, 2024

The third day was devoted to a plenary discussion of the activities carried out during the first two days; then, participants were split into working groups to identify cooperation needs focused on animal health laboratories and the results of the discussion based on seven questions and answers included in annex 3.

At the end of the meeting, recommendations for PANAFTOSA/VPH and the countries were drafted and approved, with the aim of strengthening and promoting technical cooperation in the diagnosis of foot-and-mouth disease and confounding diseases. The recommendations are as follows:

PANAFTOSA/VPH-PAHO/WHO is recommended to:

1. Maintain and apply accreditation compliant with ISO/IEC 17025, 17043 and ISO 17034 standards in order to meet the requirements of quality management standards of accreditation bodies;
2. Provide support in the processes to implement or expand quality management systems (ISO/IEC 17025);
3. Establish and validate, jointly with the countries, a protocol for inactivating suspected vesicular disease samples to be handled in BSL-2 laboratories to mitigate dissemination risks;
4. Deliver training in bioinformatics and establish protocols of metagenomic sequencing;
5. Draft a specific contingency plan guide for the laboratories in the region;
6. Promote mechanisms to maintain laboratory supplies in emergency situations;
7. Identify and recommend risk analysis methodologies in animal health laboratories;
8. Promote theoretical and practical simulation exercises in laboratories for vesicular and confounding diseases;
9. Present these results in the COSALFA 51 and urge the countries to maintain FMD diagnostic capacity, even in the absence of the disease.

Countries are recommended to:

1. Promote training, at least every two years, for the national and international shipment of biological samples, in accordance with the requirements of competent bodies;
2. Share with PANAFTOSA/VPH positive samples of FMD, vesicular stomatitis and Senecavirus A, for their characterization and addition to the reference material collection of the region;
3. Adopt the risk analysis methodology in animal health laboratories;
4. Include animal health laboratories in the national biosafety commission.

ANNEXES

ANNEX 1: Agenda

Meeting of animal health laboratories of the countries of the South American Commission for the fight against Foot-And-Mouth Disease (COSALFA)

December 10 – 12, 2024 -

Río de Janeiro- Brazil

INTRODUCTION

Welcome to the "Meeting of animal health laboratories of the countries of the South American Commission for the Fight against Foot-and-Mouth Disease (COSALFA)", an event that not only marks a significant chapter in our fight against foot-and-mouth disease but also lays the ground for the strengthening of our regional collaboration network.

Since 1951, the Pan American Health Organization, Regional Office for the Americas of the World Health Organization (PAHO/WHO), through the creation of the Pan American Center for Foot-and-Mouth Disease and Veterinary Public Health (PANAFTOSA/VPH), located in the city of Rio de Janeiro, Brazil, has been contributing as international Reference Laboratory to help countries build their capacities to respond to the diagnostic needs of foot-and-mouth disease and confounding diseases.

Considering the relevant advance in the Hemispheric Program for the Eradication of Foot-and-Mouth Disease (PHEFA) coordinated by PANAFTOSA/VPH, the surveillance system needs to be further improved complying with an effective field service capable of rapidly detecting cases of vesicular disease, backed by an efficient laboratory support capable of identifying the etiological agent in the shortest possible time.

This event is organized so that the heads/directors of animal health laboratories of the 13 COSALFA member countries involved in the diagnosis of vesicular diseases can share experiences, discuss achievements and challenges for the diagnosis of priority diseases that could be confounded with foot-and-mouth disease, identifying strengths and gaps as well as the need for technical cooperation.

On this occasion, PANAFTOSA/VPH will be also offering a discussion to get to know and identify laboratories' current needs regarding other animal diseases of public health importance with a view to strengthen regional technical cooperation.

The meeting methodology will include the presentation of the results of previously gathered relevant information on the capacities of the laboratories of the 13 COSALFA member countries, followed by strategic technical presentations, including plenary discussions and group work. The participation of representatives, guests as observers, and laboratories from the USA, Mexico and Canada is also expected.

The expected results of this meeting are the following:

1. Strengthening the regional animal health laboratory system of COSALFA countries;
2. Promoting knowledge and experience sharing between countries in order to enable regional collaboration bonds;
3. Drafting recommendations to promote improvements in quality management processes for the diagnosis of animal diseases;
4. Identifying priority technical cooperation actions of PANAFTOSA/VPH for the strengthening of the regional system of national animal health laboratories of COSALFA countries.

Tuesday, December 10, 2024 | 08:30 - 17:15h (Brasilia time, Brazil)	
HOTEL PESTANA (Av. Atlântica, 2964 - Copacabana)	
08:30 - 09:00	Badge and distribution of material The meeting will have simultaneous translation into English, Spanish and Portuguese
09:00 - 09:15	Opening of the Meeting Director of PANAFTOSA/VPH, *Ottorino Cosivi*
09:15 - 09:30	Objectives, dynamics of the meeting and presentation of the agenda
09:30 - 09:45	Introduction of participants
09:45 - 10:15	SESSION 1 - FOOT-AND-MOUTH DISEASE AND OTHER VESICULAR DISEASES IN THE AMERICAS Introduction to the subject: PANAFTOSA/VPH **1.1** Current context of the foot-and-mouth disease epidemiological situation in the region *Diego Viali,* PANAFTOSA/VPH **1.2** The role of PANAFTOSA reference laboratory and technical cooperation to the countries *Maristela Pituco,* PANAFTOSA/VPH
10:15 - 10:30	Discussion
10:30 - 10:45	Break
10:45 - 11:15	SESSION 2 – SITUATION OF ANIMAL HEALTH LABORATORIES IN COSALFA COUNTRIES 2.1 Presentation of survey *Euclides De la Torre*, PANAFTOSA/VPH 2.2 Analysis of results *Euclides De la Torre,* PANAFTOSA/VPH
11:15 - 11:30	Discussion
11:30 - 12:00	Guidelines and formation of working groups
12:00 - 13:30	Lunch
13:30 - 15:30	Group work
15:30 - 15:45	Break
15:45 - 16:30	Presentation of working groups
16:30 - 17:00	Discussion
17:00 - 17:15	Closure of Day 1 Director of PANAFTOSA/VPH, *Ottorino Cosivi*
18:00 - 20:00	Welcome cocktail

Wednesday, December 11, 2024 | 07:45 - 17:00h (Brasilia time, Brazil)	
PANAFTOSA/VPH HEADQUARTERS	
07:45	Departure from the Hotel
09:00	Arrival to PANAFTOSA/VPH
09:15 - 09:30	Welcome presentation at PANAFTOSA/VPH headquarters Director of PANAFTOSA/VPH, *Ottorino Cosivi*
09:30 - 10:30	Presentation of PANAFTOSA/VPH Cooperation Areas - Foot-and-mouth disease - Zoonosis - Food Safety - Epidemiology - Laboratory
10:30 - 10:45	Questions
10:45 - 11:00	Coffee Break
11:00 – 11:30	Public health laboratories at PAHO - Diseases with pandemic potential *Juliana Leite* – Health Emergencies Department (PHE)/Infectious threats (IHM) - PAHO
11:30 – 12:15	Additional PANAFTOSA/VPH technical cooperation approaches - Avian influenza *Dilmara Reischak* – Laboratório Federal de Defesa Agropecuária – LFDA/SP – CGAL – MAPA - Equine encephalitis *Patricia Aguilar* - Center for Tropical Diseases. University of Texas Medical Branch
12:15 - 12:30	Questions
12:30 - 13:30	Lunch
13:30 - 14:30	Visit to the facilities of PANAFTOSA/VPH technical areas
14:30 - 15:30	Visit to the Production Laboratory Visit to the BSL-3 *plus* Reference laboratory
15:45	Departure from PANAFTOSA/VPH to the Hotel

Thursday, December 12, 2024 | 08:30 - 16:30h (Brasilia time, Brazil)	
HOTEL PESTANA (Av. Atlântica, 2964 - Copacabana)	
08:30 - 08:55	Guidelines and methodology for morning activities
08:55 - 09:45	Arrangement of working groups – identifying cooperation needs and drafting recommendations
09:45 - 10:00	Coffee Break
10:00 - 12:00	Summary presentation of the results of the activities of day 1 *Euclides De la Torre,* PANAFTOSA/VPH
12:00 - 13:30	Lunch
13:30 - 14:30	Presentation and approval of recommendations in plenary session *Euclides De la Torre,* PANAFTOSA/VPH
14:00 - 14:30	Closure of the Meeting Director of PANAFTOSA-PAHO/WHO, *Ottorino Cosivi*

ANNEX 2: List of participants

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Gabriel Torres
Guilherme Marques
Iassudara García de Almeida
Manuel Sánchez
Michele Sanches
Monica Martini
Ottorino Cosivi

ANNEX 3: Results of working group discussion to identify technical cooperation for animal health laboratories

Based on the discussion of seven questions and answers to define the core needs of technical cooperation for the countries of the region.

1. In relation to what other diseases do you think your country requires assistance with?
    - Leptospirosis
    - Brucellosis
    - Tuberculosis
    - Rabies (improve techniques)
    - Animal influenza
    - Poxvirus
    - Equine encephalitis
    - Exotic diseases

2. What type of technical cooperation in the laboratory could be beneficial regarding the diseases mentioned?
    - Laboratory diagnosis – harmonization of diagnostic methodologies
    - Epidemiology
    - Training in molecular techniques, whole genome sequencing and bioinformatics
    - Training in the surveillance of vector-borne diseases (equine encephalitis)
    - Training in AMR (antimicrobial resistance)
    - Support to action plans
    - Supply of reference materials
    - Course to elaborate reference material
    - Advice on the creation of a BSL-3 laboratory
    - Training in vaccine assessment
    - Contingency plan for laboratories

3. Do you think you need support for laboratory quality management activities, shipment of biological samples, biosafety, and other activities requiring support?
    - Integrate national biosafety commissions with the regional commission.
    - Draft biosafety guidelines regarding disease-based risk analysis.
    - Joint training in human and animal health for sample shipment (IATA).
    - Quality management.
    - Support in the implementation and maintenance of a Biological Risk Management System in accordance with ISO 35001 Standard.
    - Training in ISO 17034 and ISO/IEC 17043 Standards, as some countries wish to apply these standards at internal level.
    - Training in biosecurity

4. How can PANAFTOSA/VPH-PAHO/WHO improve integration between the national laboratories of the region?
    - Strengthening the structure of the network of COSALFA animal health laboratories and expanding it to other countries of the American continent.
    - Creating interactive working groups for consultation and exchange of specific topics (RED group).
    - Holding technical meetings according to the countries' demands.

5. What type of training or knowledge sharing would you like to receive or deliver?
    - Metagenomics, bioinformatics
    - Risk analysis
    - Information exchange on animal diseases in the region (IVVO)
    - Diagnosis of equine encephalitis
    - Diagnosis of avian species

6. Identify potential synergies between animal and public health laboratories to complement national diagnostic capacity in zoonotic diseases, e.g., exchange of sequencing, trained staff for sample shipment, shared purchase of reagents, among others.
    - Training in topics such as IATA
    - Sequencing
    - Bioinformatics
    - Joint simulation drills
    - Reagents, exchange of strains, training, analysis of emergency samples

7. Identify also PAHO technical cooperation activities such as training, technical recommendations, etc., that can apply to both animal health and public health laboratories.
    - Using PAHO's emergency mechanism for the procurement of reagents and supplies
    - Import and export permits for samples and reagents
    - Regional reagent bank, diagnostic kits in the event of animal and public health emergencies.
    - Training in zoonotic diseases
    - Technical meetings to get to know the activities of each organization and establish priorities