



Pan-American Health Organization

Regional Office of the
World Health Organization

Veterinary Public Health
Pan-American Foot-and-Mouth Disease Center

Technical Note on the Foot-and-Mouth Disease Situation in Ecuador

I. Background

The animal health authorities of Ecuador have been requesting PANAFTOSA'S technical cooperation to support their National Foot-and-Mouth Disease Eradication Program, particularly in assisting with the response to the increase in clinical cases of foot-and-mouth disease (FMD) since mid-2008.

In this context and within the framework of the Hemispheric Program for FMD Eradication (PHEFA), PANAFTOSA has undertaken a series of activities, including advisory visits to support operational planning and field operations, as well as reference laboratory studies of viral strains collected from FMD outbreaks and provided to PANAFTOSA by the Official Veterinary Service. In all cases, at the completion of the missions and/or reference laboratory studies, the Official Veterinary Service was provided with a report of activities, including conclusions and recommendations. PANAFTOSA has persistently been recommending, among other actions, establishing a database on the national bovine/bubaline population, strengthening of the FMD vaccination program, implementation of strict control of animal movements and an effective response to the occurrences of vesicular diseases.

In 2010, the national authorities of Ecuador requested the advice of PANAFTOSA about the discrepancies in the interpretation of laboratory studies of field strains collected from FMD outbreaks that occurred in Ecuador in 2010. These field strains were studied by four different OIE reference laboratories, including PANAFTOSA. The vaccine matching study carried out by PANAFTOSA indicates that the use of commercial vaccines of proven quality containing the 01 Campos strain through whole population vaccination and re-vaccination campaigns would be effective in protecting the national herd against the field strains. On the other hand, we understand that other reference laboratories identified some antigenic modifications in some isolates of field strains which are relevant to the reference 01 Campos used in commercial vaccines and that could adversely affects the result of the vaccination campaigns.

We analyzed the available information and provided the official authorities of Ecuador a report clarifying that the different OIE reference standards methodologies and interpretation of results among the reference laboratories would explain the discrepancy in the interpretation of the different laboratories. On the basis of previous comparative

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studies carried out by PANAFTOSA using the different methodologies and interpretations applied to the same set of data, PANAFTOSA reiterated to the official authorities of Ecuador the conclusions and recommendations previously issued.

More recently, the Official Veterinary Service of Ecuador informed PANAFTOSA that it had received information on a challenge study carried out *in vivo* by the reference laboratory of the Servicio Nacional de Sanidad y Calidad Agroalimentaria of Argentina (SENASA), using an experimental 01 Campos vaccine and challenging the vaccinated animals (first vaccination and re-vaccination) with a field strain isolated in Ecuador in 2010. At the request of the Minister of Agriculture of Ecuador, a technical meeting to discuss these laboratory data was convened in order to support decision making.

Such meeting was held in Quito, Ecuador, with the participation of professionals from AGROCALIDAD and the Ministry of Agriculture of Ecuador, as well as representatives of SENASA, FAO, IICA, OIE/GIEFA, and PANAFTOSA/PAHO. The meeting reviewed and analyzed both the FMD health situation and the results of the studies carried out by SENASA and PANAFTOSA. Based on the information and opinions exchanged at the meeting, PANAFTOSA, in its capacity as coordinator of the PHEFA, prepared a report, including conclusions and recommendations.

II. Technical Analysis

1. The laboratory results presented by SENASA, the results of the other reference laboratories made available by AGROCALIDAD, and the information on the epidemiologic situation in Ecuador submitted by AGROCALIDAD were all considered in conjunction with the information held by PANAFTOSA. This information includes the studies on the viral characterization and immunological coverage (vaccine matching) of the vaccine strain with relation to the field strains isolated in Ecuador, the experience accumulated in this specific field in the last three decades by this Center working in close association with the countries of this Region and of the information available at PANAFTOSA on the FMD situation in Ecuador.
2. In accordance with the methodologies recommended by OIE, different interpretations are possible for the same set of results of serologic tests reported in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (2010). This explains the different interpretations and recommendations provided by the different laboratories with regard to the FMD virus strains isolated from Ecuador in 2009 and 2010.
3. The results of the challenge study carried out *in vivo* presented by SENASA, which indicate that the experimental 01 Campos vaccine strain **did not protect animals vaccinated with this strain and challenged with a field strain of the O virus isolated from a 2010 outbreak**, are not consistent with the field epidemiologic situation prevailing both in Ecuador and in the border zones of neighboring countries. We thus deem it necessary to obtain further information (such as: field representativeness of the virus strain selected for the challenge test, details on the quality of the experimental vaccine used, methodology of preparation and titration of the challenge virus and its



conservation conditions, characteristics of the tested animals, etc.), which would permit us to reach an authoritative conclusion about these results.

4. Based on the information currently available, we conclude that in the last eight years the FMD virus has been circulating endemically in Ecuador, with the occurrence of epidemic outbreaks, which more recently have occurred in 2009 and in 2010 and have compromised a substantial part of the territory of Ecuador. From a technical viewpoint, PANAFTOSA believes that this situation is due to the deficient implementation of the FMD control program, which has not been able to interrupt the virus' endemic circulation, because of the poor effectiveness of the vaccination campaigns, the field use of vaccines of questionable quality due to its conditions of conservation, among other factors, and the weaknesses of animal movement controls.
5. We would like to refer to the implementation of the vaccination campaigns in Ecuador, in which various factors, such as the weaknesses in their planning, execution, control, and evaluation, the insufficient control of the process of vaccine application in the field, and the difficulty of achieving the full adherence of the cattle owners' community to the campaigns have impeded attaining a sufficient and sustained level of immunization coverage of the animal population able to interrupt viral circulation. Under these circumstances, the partial and insufficient immunization coverage allows the endemic circulation of viral strains in some areas; this could explain the genetic/antigenic modifications such as those observed in some virus strains isolated in 2010 and discussed at the aforementioned meeting. However, such modifications do not necessarily imply a significant deviation from the standard strains used in the vaccines.

III. Recommendations

On the basis of what is listed above, and with the objective of contributing to overcome the current situation, we urgently recommend introducing substantial changes in the way the National FMD Eradication Program of Ecuador is implemented, including the following:

- Implementing, as soon as possible, an intensified vaccination campaign under the supervision of the Official Veterinary Services, with special attention to primary and secondary endemic zones. Ideally, the target should be the vaccination of the entire bovine/bubaline population (regardless of age) and its re-vaccination within between 30 and 60 days, using commercially available bivalent 01 Campos and A24 Cruzeiro vaccines of proven quality (potency, safety, and purity).
- Simultaneously to the intensified vaccination campaign, strengthening the official controls of animal movements, particularly applying movement restrictions to livestock farms posing risk of viral circulation and to those that do not practice the full and systematic vaccination of their herds.
- Activating a mechanism of intensified epidemiologic investigation of FMD clinical occurrences, and the submission of field samples for reference laboratory studies,



with the objective of monitoring on a permanent basis the circulating virus and its effect on the susceptible population.

IV. Final considerations

Based on our analysis, **we conclude that we do not have evidence that indicates the need to change the vaccine composition and that it is premature to make decisions about the use of a vaccine prepared with a field strains.** We further conclude that if the proposed aforementioned sets of actions are implemented, it is possible to interrupt the endemicity, as has been consistently and successfully demonstrated in other countries of the region. **We thus recommend the use of vaccines of proven quality prepared with the 01 Campos and the A24 Cruzeiro strains be continued.**

Lastly, it is important to emphasize that the control and eradication of FMD in Ecuador requires intensified efforts on both the national and the regional levels to facilitate the adoption of prompt, short- and long-term measures capable of interrupting the virus endemic circulation cycle and of finally eradicating the disease. To this effect, PANAFTOSA will submit a specific technical cooperation plan to the Minister of Agriculture of Ecuador.

It is hoped that this plan will have the collaboration of countries and cooperating agencies in order to support and strengthen the actions of the National FMD Eradication Program of Ecuador.

Rio de Janeiro, 31 January, 2011.

