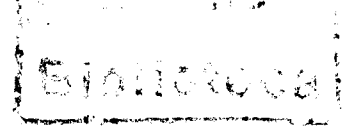




PAN AMERICAN HEALTH ORGANIZATION



# INTER-AMERICAN MEETING ON FOOT-AND-MOUTH DISEASE AND ZONOSSES CONTROL

WORLD HEALTH ORGANIZATION

WASHINGTON, D.C., 8-11 APRIL 1968

RICAZ/27 (Eng.)  
6 April 1968  
ORIGINAL: SPANISH

1967

## STATUS OF FOOT-AND-MOUTH DISEASE CONTROL PROGRAMS (Summary)\*

ARGENTINA  
BOLIVIA  
BRAZIL  
CHILE  
COLOMBIA  
ECUADOR  
PARAGUAY  
PERU  
VENEZUELA

---

\*This document contains a summary of the answers to the questionnaires sent in by the countries and has been prepared to expedite the work of the Working Groups.

STATUS OF FOOT-AND-MOUTH DISEASE  
CONTROL PROGRAMS (Summary)

ARGENTINA

The foot-and-mouth disease control campaign, based on systematic, compulsory and supervised vaccination, was begun in 1960 and at present covers 90% of the cattle of vaccination age in the affected area, distributed in more than 350,000 livestock establishments registered with the campaign. In most cases the vaccine is administered by livestock owners with the advice of the staff of the Health Campaigns Official Service (SELSA).

The program has been carried out by stages. The number of cattle vaccinated each year in the vaccination areas is as follows:

<u>Year</u>	<u>Millions of Head</u>
1962	17
1963	30
1964	36
1965	40
1966	42
1967	45

Vaccine production has gradually increased, as may be seen from the number of doses authorized for sale:

<u>Year</u>	<u>Million of Trivalent doses</u>
1962	81
1963	161
1964	136
1965	156
1966	132
1967	159.5

The vaccines are produced in 12 private laboratories which could increase present production by 50 per cent. The vaccines are tested by an official laboratory which at present tests the potency in cattle of 50% of the series of vaccines produced in the country.

Up to 1960 foot-and-mouth disease morbidity in cattle was estimated to range from 10% to 30% annually; in the last five years morbidity has been as follows:

	<u>Morbidity</u>	<u>No. of Foci</u>
1963	1.31%	5,020
1964	0.82%	5,105
1965	0.86%	4,286
1966	0.82%	5,225
1967	0.59%	4,634

Of the 45 million cattle only 265,701 head (0.59%) were attacked by the disease in 1967, and among livestock producers the general impression is that the picture has changed considerably for the better compared with the earlier years of the campaign.

In recent years, new virus subtypes have been identified in the country and have been designated as follows: A19, A25, A26 and C Tierra del Fuego; the last mentioned was isolated in an outbreak on that island where the control method used was slaughter.

The enormous importance to the national economy of livestock production and the export of meat and animals on the hoof led the authorities to give first priority to the foot-and-mouth disease campaign which accounts for 80% of the activities of SELSA. Vaccination was made compulsory by the Decree of 12 August 1960, since "foot-and-mouth disease is the main health problem affecting livestock in Argentina, both production and marketing inside and outside the country".

With 30% of the animals affected each year the enormous losses caused by the disease have been estimated at 68,000 million pesos (about 200 million dollars) annually. However, with a morbidity rate of 0.59% in 1967 losses amounted to 3,400 million pesos (8.3 million dollars), which figure includes the cost of vaccine, its administration, and the administrative costs. Therefore, the campaign produces a benefit of more than 65,000 million pesos, that is, more than 185 million dollars.

The expenditure of SELSA on the execution of the campaign during recent years has been as follows:

1961	93.5 million pesos
1962	101.2 " "
1963	260.9 " "
1964	387 " "
1965	472 " "
1966	560 " "
1967	678.2 " "

For the period 1968-1972 the sum of 676.2 million pesos has been budgeted annually. Argentina is preparing a loan application to be submitted to the Inter-American Development Bank (IDB) to finance part of the campaign, since it is necessary to construct new government laboratories to increase the number of tested batches of vaccine; improve equipment; and train 20 professional health workers each year for five years in laboratory and field work.

As for the multinational aspect of the foot-and-mouth disease campaign, Argentina is a member of the Regional Technical Animal Health Commission established by agreement with the countries of the Southern Cone and also a member of the Argentina-Chile Commission for the prevention of foot-and-mouth disease in the southern zone of both countries.

There was a single outbreak of vesicular stomatitis in November 1963; no outbreaks were registered in 1965; one outbreak in 1966; and the last in 1967 in Posadas, Misiones Province. Only horses were affected in these outbreaks, and the virus diagnosed was the Indiana virus.

#### BOLIVIA

Although the authorities are interested in carrying out a national control campaign, it has only been possible so far to launch local campaigns to control and prevent the spread of outbreaks. A pilot program of systematic and supervised vaccination is being conducted in the Department of Cochabamba with the assistance of the Pan American Foot-and-Mouth Disease Center. Some livestock producers, in the Oriente Region in particular, are voluntarily protecting their animals, using vaccines prepared in the laboratory of the Ministry of Agriculture or imported from Argentina and Brazil.

There are no private laboratories in the country. The Government production laboratory began operation at the end of 1965 and in 1966 produced 88,216 doses of inactivated trivalent vaccine and 295,000 doses in 1967. Livestock owners administer the vaccine themselves and only in the case of programs of the Ministry of Agriculture, for example the Cochabamba program, is it administered by government officials. These programs enjoy the full support of livestock producers and the assistance of civil and military authorities whenever necessary.

The disease is especially serious in the Oriente Region since the lesions are frequently complicated with myiasis and secondary infections. A detailed study has been planned of the losses caused by foot-and-mouth disease; the harmful impact of the scourge is fully realized as is shown by the fact that together with paralytic rabies in cattle it has been assigned first priority in planning the development of the livestock sector.

Priorities are established by a joint committee composed of representatives of the Ministry of Agriculture, Planning and Coordination Secretariat, Treasury and Statistics and receive official sanction in the Annual Plan of the Planning and Coordination Secretariat of the Office of the President of the Republic.

A decree is in force which authorizes animal health authorities to make vaccination compulsory in any areas they deem it advisable.

It is estimated that in 1966 and 1967 about US\$35,000 were earmarked for the foot-and-mouth disease control program each year, and that the conduct of a proper national program for five years would cost about US\$2,350,000, corresponding to investment costs of US\$500,000. The preparation of a loan application to the Inter-American Development Bank is under consideration. Its purpose would be to obtain financing for the campaign and a request for assistance in preparing the loan application has been made to the Pan American Foot-and-Mouth Disease Center.

The national campaign will have to be based on the use of modified live virus vaccine since there is only sufficient raw material available to produce 700,000 doses of trivalent inactivated vaccine annually. An agreement has been made with the Pan American Foot-and-Mouth Disease Center to test the modified live virus vaccines in the Department of Santa Cruz. It is necessary to construct a new laboratory to produce modified live virus vaccine and personnel at different levels need to be trained, both in laboratory and field work, for which purpose two long-term fellowships and five short-term fellowships a year are needed for a period of three years. In addition, intensive national training courses are necessary. It is hoped to obtain the necessary assistance in carrying out this program.

With respect to multinational activities, Bolivia has a draft International Agreement with Peru for foot-and-mouth disease control in the border areas and although it has not yet been signed, special attention is being devoted that region. Furthermore, in June 1967, Bolivia signed the Inter-American Animal Health Agreement, thus joining the other signatory nations, Argentina, Brazil, Chile, Paraguay and Uruguay.

#### BRAZIL

The National Foot-and-Mouth Disease Campaign was instituted in the Ministry of Agriculture by a decree of 1963, and a start was made on the technio-administrative infrastructure and the necessary legislation. A compulsory, systematic and supervised vaccination campaign based on trivalent inactivated vaccines administered every four months was begun in December 1965 in the State of Rio Grande do Sul, in the region contiguous with Uruguay and Argentina. It was gradually extended to cover new areas in that state and in the remainder of the southern part of the country consisting of Santa Catarina, Parana and São Paulo states. By 31 December 1967 the campaign had

achieved the following results: cattle were vaccinated by livestock producers under the supervision and inspection of the campaign veterinarian:

State	No. of Head	No. of Vaccinations	Livestock Breed-ers Serviced	Herds vaccin- at that date
R. G. do Sul	8,000,000	42,854,887	158,365	80.0%
Santa Catarina	574,522	1,645,028	34,120	51.8%
Parana	474,969	1,616,541	2,392	40.0%
São Paulo	541,326	1,109,387	2,196	15.0%
R. de Janeiro	1,000,000	3,320,000	13,162	60.0%

In addition, in the states of Minas Gerais, Goias, Pernambuco, Paraíba and Brasilia DF, preparatory arrangements for the campaign and vaccinations administered by official and private vaccinators under supervision were as follows:

State	No. of Cattle Vaccinated	Livestock Producers Serviced
Minas Gerais	1,866,970	7,032
Goias	102,884	628
Pernambuco	773,077	4,099
Paraíba	747,251	5,825
Brasilia DF	16,149	155

There are 13 private laboratories situated in five states. Their production capacity could be increased, but in 1967 they produced 66,539,402 doses of trivalent vaccine. These products are inspected by a specialized Government veterinarian permanently attached to each private laboratory. In addition the vaccines are tested in two Government laboratories. In 1967, 60,259,870 doses were approved and licensed for use. The effectiveness of the vaccines is also checked by means of seriological examinations of vaccinated animals.

There are also six Government production laboratories situated in five states whose potential production is 14,400,000 doses and whose capacity is expected to increase in the coming years.

All three types of virus exist in the country and in addition three subtypes of virus A and one subtype of virus O have been diagnosed.

The importance of the enormous cattle holdings and the need to increase food production as well as to increase exportation and to develop livestock programs have lead the authorities to give high priority in the animal health sector to foot-and-mouth disease campaigns. That priority

was established through the Ministry of Agriculture, which prepares the projects for agricultural development for subsequent examination by the Ministry of Planning and in accordance with the National Plan of the Government they are given an order of priority. The three-year plan 1968-1970 of the Government of Brazil gave priority to foot-and-mouth disease in Decree No. 52.344/63.

The losses caused by foot-and-mouth disease in cattle alone have been estimated at NCr.\$716,423,134 or US\$223,882,228.

The cost of the campaign to the Ministry of Agriculture, not including the contributions of the Secretariats of the States or the cost of vaccine and its administration by livestock owners, is as follows:

<u>Year</u>	
1963	NCr\$ 420,000
1964	900,000
1965	1,200,000
1966	2,900,000
1967	2,200,000
1968	3,300,000 (earmarked)

The amount calculated for 1969 is NCr\$9,000,000 and for 1970, NCr\$12,000,000.

Brazil has submitted a loan application to the Inter-American Development Bank for assistance in financing a national campaign.

With respect to the multinational aspects Brazil, together with Argentina, Bolivia, Chile, Paraguay and Uruguay, signed the Inter-American Animal Health Agreement in 1967. There is also a Brazil-Uruguay Bilateral Agreement specifically referring to foot-and-mouth disease and providing for mutual cooperation and technical assistance, and two other specific agreements on foot-and-mouth disease between Argentina, Brazil, Guyana and Venezuela are being negotiated.

#### CHILE

Owing to a lack of funds it has so far not been possible to carry out a national foot-and-mouth disease control plan. At the present time activities are limited to the application of health control measures, stimulation of voluntary vaccination, reporting of the disease, and the conduct of local vaccination campaigns when resources so permit.

In Chile there are three production laboratories, one belonging to the Government and the other two private. Their production capacity is 10,700,500 doses of inactivated and trivalent vaccines annually. The construction of new production laboratories is not considered necessary, but the construction of an official control laboratory is provided for in the National Plan.

The Government of Chile has submitted a loan application to the Inter-American Development Bank for the financing of the national campaign. It was prepared by the National Foot-and-Mouth Disease Commission, with the assistance of the Pan American Foot-and-Mouth Disease Center.

Cases of the disease are registered but it is estimated that, owing to failure to report diseases, the following figures represent only a very small proportion of the actual number of cases that actually occurred:

<u>Year</u>	<u>No. of Foci</u>	<u>No. of Cases</u>
1961	367	15,402
1962	720	23,113
1963	371	10,747
1964	799	37,100
1965	688	22,168
1966	139	5,089
1967	413	12,355

The most important outbreaks occurred in 1945, 1950, 1956, 1960, 1962, 1964-65 and 1967. It has been estimated that losses caused by foot-and-mouth disease amount on the average to Ls.37,375,000 annually, only in direct losses in cattle. A national campaign would establish more favorable conditions for the better development of livestock production, but it is believed that even with the present number of cattle it would be possible to have a seven million more liters of milk and eight million more kilos of meat. The reduced production of meat and milk should also be evaluated in terms of foreign exchange, which has to be spent in order to make up the shortfall through imports.

Trade in sheep and wool with other countries, including the sale of sheep for breeding purposes, would have better prospects, especially in Latin America.

For the development of livestock production in the area at present free of foot-and-mouth disease in the south, breeding cattle must be imported from countries free of the disease at a cost considerably higher than that on the domestic market.



The Ministry of Agriculture, through the Agriculture and Livestock Production Service, is responsible for the campaign, and this agency is legally entitled (by Decree with force of Law RRA No. 16 of 9 March 1963 and No. 15 of 22 January 1968) to make vaccination compulsory throughout the country.

The Ministry has assigned first priority to the national foot-and-mouth disease control plan among health programs; this priority is prescribed by the Law of 28 July 1967 and Decree with force of Law No. 44 of 13 February 1968.

The national health plan provides for close cooperation with producers and public and private bodies.

The possibility of obtaining fellowships from national and international agencies for training of campaign personnel at all levels is being considered.

With respect to multinational coordination, Chile is a member of the Regional Technical Animal Health Commission together with Argentina, Brazil, Bolivia, Paraguay and Uruguay, and an agreement which is to be ratified by the Argentine-Chile Commission for the prevention of FMD in the southern zone of both countries has been prepared. A meeting is planned for March 1968 at Punta Arenas, Chile, and will be attended by the Ministers of Agriculture of both countries, who will discuss coordination of foot-and-mouth disease control activities in frontier areas.

There is also in existence an agreement with the Pan American Foot-and-Mouth Disease Center to test modified live virus vaccine.

#### COLOMBIA

A mass, systematic national foot-and-mouth disease campaign has not been carried out as fully as possible, owing to the lack of financial resources and other factors, despite the fact that the animal health program is the most important program of the Ministry of Agriculture.

Foot-and-mouth disease first appeared in 1950, and control activities were begun using vaccines imported from Europe. From 1954 onwards vaccines were manufactured in the country and the initial production was 500,230 doses.

The only vaccine-producing laboratory is the Instituto Zooprofiláctico Colombiano, a government agency whose present capacity is 15 million doses and whose potential capacity is 40 million doses. A study has been made of its expansion and the necessary funds provided, and a government laboratory for testing these vaccines and other biological products is being organized.

All the batches of vaccine are subject to innocuity and sterility tests, and potency tests are carried out periodically in cattle and guinea pigs, the Lucam C index being followed in the tests.

Two subtypes have been identified and designated as O1 and A27.

In the last five years the following amounts of bivalent O and A vaccines have been produced and administered:

<u>Year</u>	<u>Produced</u>	<u>Doses Administered</u>
1963	7,077,385	5,846,335
1964	5,723,370	5,619,535
1965	6,919,130	7,216,140
1966	7,338,695	7,117,935
1967	9,985,000	8,900,000

The total amount of vaccine produced last year was only sufficient to vaccinate 25% of the existing stock. It was administered by livestock producers or government officials, or jointly.

The incidence of the disease varies from zone to zone and region to region in the country, and there are even some areas still free of the disease, such as the northwest of the Region of Choco, which is contiguous with Panama.

For Colombia the control of foot-and-mouth disease is of major importance since, because of it, the European and United States markets are closed to it, to the great detriment of livestock production. A good preventive campaign would not only make it possible to control the disease but also to make a start on eradication and would put the country in a very favorable position with respect to international markets.

The losses caused by the disease range, according to various estimates, from between 200 to 646 million pesos.

Because of its importance the foot-and-mouth disease control campaign occupies the first place in the planning of the development of the livestock sector (Animal Health), which is the exclusive responsibility of the Ministry of Agriculture.

Decree No. 1254 of 1949 on animal health authorizes the Ministry to issue regulations to defend livestock against existing diseases or any others that may appear. Compulsory vaccination is legally required throughout the country.

The Ministry of Agriculture is responsible for the campaign in collaboration with the Instituto Zooprofiláctico Colombiano and the Instituto Colombiano Agropecuario.

A plan exists for the establishment of an Institute of Livestock Promotion, which would encompass all the agencies that should promote livestock production from the standpoint of health and the livestock industry.

The Pan American Foot-and-Mouth Disease Center, the Instituto Zooprofiláctico Colombiano and the Instituto Colombiano Agropecuario act as advisers and consultants for the campaign. Other decentralized agencies such as INCORA the Agricultural Credit Fund, the Colombian Federation of Livestock Owners and the Departmental Livestock Fund give full support to the campaign, as do the civilian and military authorities.

In recent years the Ministry of Agriculture has allocated to the foot-and-mouth disease control campaign a large part of the funds for health campaigns; in 1968, 14,389,000 pesos were earmarked for the campaigns, with a specific item of 1,000,000 pesos for the Colombia-Ecuador agreement and another of 500,000 for the Choco agreement. The following amounts have been estimated for the health campaigns in which foot-and-mouth disease is given priority:

<u>Year</u>	
1969	22,038,499 pesos
1970	25,344,268 pesos
1971	29,145,905 pesos

Animal health programs together with their budget estimates for five years have been submitted to the National Planning Department for the purpose of obtaining external financing if it is not possible to finance them with national resources. The Instituto Zooprofiláctico Colombiano has prepared a request for an external loan.

Technical assistance and loans are needed from international lending agencies in order to carry out a proper campaign. It is also believed that it would be advisable to have as many personnel as possible trained in field and laboratory activities.

With respect to multinational activities there is an agreement in operation between Colombia and Ecuador for the control of foot-and-mouth disease in their border areas, and another for prevention of the disease in the north-western region of the Choco which is contiguous with Panama.

A new multinational agreement is being negotiated between Colombia and the countries of the OIRSA area and between the Bolivarian countries, through the Bolivarian Plant and Animal Health Organization (OBSA).

ECUADOR

The disease was diagnosed in Ecuador for the first time in 1956, and had special epidemiological aspects because of the geographical characteristics in which livestock production is carried on and the means of communication between the three zones into which the country is divided, that is to say:

- a) Western Zone (Litoral or Coast) - 550,000 cattle
- b) Central Zone (Inter-Andean or Sierra) - 950,000 cattle
- c) Eastern Zone (Trans-Andean or Amazonian) - 150,000 cattle

A properly planned program for the conduct of a national foot-and-mouth disease is in existence; vigilance and preventive measures are being applied in areas free of the disease within the country, and control activities are being carried on in recently infected areas and in others in which the disease is enzootic.

In 1959, a sharp outbreak on the Litoral caused much concern among livestock owners and necessitated the rapid intervention of the government authorities to control it. This event led to the approval in 1961 of the Emergency Decree Law establishing the Animal Health Center as the agency responsible for the control of foot-and-mouth disease. Subsequently it extended its activities to the control of other diseases. Control activities have often not been carried out or have been suspended owing to the lack of funds or delays in obtaining them.

Valuable assistance has been received at all times from the livestock owners' association of the Litoral and the Sierra, the Chambers of Agriculture, and also full collaboration from civil, police authorities and the army in carrying out quarantine measures, transportation of vaccine, etc.

The vaccine used for vaccination is a bivalent modified live virus vaccine prepared by the government laboratory as well as that provided on occasions by the Pan American Foot-and-Mouth Disease Center and also an inactivated vaccine imported from Colombia. The government laboratory has a production capacity of 700,000 doses a year, but it will be necessary to construct a new laboratory with an increased production capacity for the conduct of the national program.

In March 1967 an outbreak due to Vallee O virus occurred in the provinces of Guayas and Los Rios and caused considerable losses owing to the fact that about 30% of the cattle were affected and 25% of calves up to the age of eight months died.

The local production of modified live virus vaccines from strains prepared by the Pan American Foot-and-Mouth Disease Center was initiated

with highly satisfactory results in potency testing and field application. The vaccines are nearly always administered solely by government personnel, but at the end of 1967 and the beginning of the present year, owing to lack of staff, livestock owners were allowed to administer it after they have been trained. It is hoped that once the financial situation has been remedied, it will be possible to go back to the system of free, systematic, and compulsory vaccination.

The economy of Ecuador is essentially an agricultural one, and this sector accounts for about one-third of the Gross National Product. Owing to the present downward trend of the prices of its main export products - bananas, coffee, cocoa - the country is placing its hopes in the production of meat and milk for export to make up for the fall in exports of the above-mentioned products. For this reason the Government is encouraging livestock production and has obtained a loan of \$4 million for a beef cattle program. Before approving the credit the lending agency ascertained whether Ecuador was carrying out proper plans for the control and eradication of various diseases and in particular foot-and-mouth disease. Other banks interested in investing capital stipulate that programs for the control of livestock diseases should continue in order to ensure a good return on the investment and the repayment of principal; furthermore, the planning agencies of Ecuador require that any livestock development program make provision for animal health activities.

The Executive Power regards the conduct of a national foot-and-mouth disease program as a first priority. The Decree establishing the Animal Health Center stated that the aim was to control and eradicate animal diseases and to give priority to the conduct of the campaign against a nationwide foot-and-mouth disease.

The priority of the campaigns is determined by the Animal Health Center, through the Consultative Committee after examination of the various options prepared by the Executive Committee. The National Economic Planning and Coordination Board has the last word as to priorities; health campaigns are related to the livestock production program, especially those which are funded by foreign credit.

The basic documents for the establishment of priorities consist of "Agricultural Planning in Ecuador", Livestock Development Production Program, and the Law on Animal Health, in addition to Executive Decree No. 07 of 10 February 1961; No. 22 of 22 May 1961 and Legislative Decree No. 015 of 9 March 1967. By means of the last-mentioned the National Assembly declared the outbreaks of foot-and-mouth disease which occurred in February 1967 in the province of Pichincha in the Sierra and Guayas on the coastal strip to be national emergencies. As a further example of the importance attributed to the foot-and-mouth disease campaign we may state that in 1960 a Decree was issued giving priority to campaigns in the areas affected by the disease and designating the National Executive Committee responsible for dealing with the problem.

The agency responsible for the control campaign is the Animal Health Center (C.S.P.) and on 9 March 1967 the National Assembly by means of Decree No. 015 re-established its financial and administrative independence and created the Animal Health Court attached to the C.S.P. with jurisdiction over the whole country and whose purpose it is to punish infringements of the Animal Health Law. The C.S.P. consists of a Special Animal Health Defense Committee composed of representatives of the Ministry of Agriculture and Livestock, Ministry of Finance, Defense, Chambers of Agriculture, Association of Livestock Owners of the Sierra and the Litoral. The C.S.P. is responsible for approving the plan of action, proposing regulations, seeking funds and supervising their use. Above that comes the Executive Committee, which is responsible for preparing the budget, issuing regulations, and reporting to the Ministry of Agriculture and Livestock, and above that, the Governing Bodies and advisers of PASB/FMDC, FAO and OIE.

Campaign costs since 1961 are shown in the following table:

<u>Year</u>	<u>Sucres</u>	<u>Dollars</u>
1961	2,600,000	130,000
1962	6,450,000	322,500
1963	5,500,000	275,000
1964	5,000,000	250,000
1965	5,500,000	275,000
1966	6,300,000	316,000
1967	9,400,000	470,000
1968	8,000,000	400,000

No loans have been received from national or international organizations but in 1961 operations were begun as a result of a loan from AID and in 1966 C.S.P. obtained from the Central Bank a loan for the foot-and-mouth disease campaign in the amount of up to 10 million sucres of which only 3 million have been repaid with income coming from taxes.

A loan application is being prepared with the assistance of the Pan American Foot-and-Mouth Disease Center and will be submitted to an international agency, and the IDB has been asked to contribute US\$42,500 towards the engineering aspects of the project.

Ecuador-Colombia Agreement. The program was begun in 1964, and, before the signature of this agreement, more than 76,000 cattle had been vaccinated as a result of the joint program. The two countries and the Pan American Foot-and-Mouth Disease Center hold periodical meetings to evaluate the progress of the program in the border area.

In 1963, Ecuador became a member of the International Bureau of Epizootics (OIE) and in mid-1967 signed an agreement with the Pan American Health Organization for the use of modified live virus vaccine, which agreement was extended until 1966. Ecuador wishes to sign a draft agreement with Peru for which purpose international technical meetings were held in 1963, 1964, and 1965. In 1965 C.S.P. became a member of the Bolivarian Plant and Animal Health Organization (OBSA).

Its staff need more training abroad in the production of modified live virus vaccine and inactivated vaccine; five technicians need training in diagnostic procedures and serology; and four professional health workers in field activities.

#### PARAGUAY

Preparatory activities for the national campaign are under way, and the campaign itself will soon be launched, probably in June 1968. The vaccine will be administered by both government personnel and by the livestock owners themselves.

A, O and C viruses are present in the country, and material collected during outbreaks is sent to the Pan American Foot-and-Mouth Disease Center.

The disease is widespread throughout the country and is estimated to affect a high percentage of the cattle every year. The losses have been estimated by the Technical Secretariat for Planning attached to the Office of the President of the Republic at about 100,000 million guaranies (US\$8,064,516) for 1962.

The disease is a constant depressive factor on any effort to improve livestock production, and the loss in meat, milk and animal by-products is also a loss in foodstuffs to the population as well as in foreign exchange and increased value for the agricultural sector. Foot-and-mouth disease prevents the country from exporting frozen and cured meat, for which the best prices are available and for which there are the most stable markets. Therefore the control and eradication of this disease is a pressing need. The National Government is aware of that fact and has assigned high priority to the National Foot-and-Mouth Disease Control Plan in the planning of agricultural development and national development.

Priorities for the allocation of investments are submitted to the Government by the Technical Secretariat for Planning after having been discussed and jointly worked out with the respective ministries and approved by the National Economic Coordination Council, which is under the chairmanship of the President of the Republic.

The agency in charge of the campaign is the National Foot-and-Mouth Disease Control Service (SENALFA) established by the Law of 4 September 1967.

It is an independent, administrative and technical agency which is run by a Directing Council on which sit representatives of the main agencies and bodies connected with the livestock industry. It consists of a chairman, who is appointed by the President, two representatives of the Ministry of Agriculture and Livestock Production, a representative of the Paraguay Rural Association, one of the Paraguayan Meat Corporation and one from the School of Agriculture and Veterinary Medicine. The above-mentioned law makes vaccination compulsory, and the livestock organizations are giving full support to the campaign and represented both on the Directing Council and on the Zonal Councils and Local Committees which are being formed.

The expenditure earmarked in the plan is US\$6,200,000 for a period of four years, and for the year 1968 the budget estimates amount to 28,500,000 guaranies (US\$226,000), provided exclusively from local resources. A loan application to the Inter-American Development Bank (IDB) is being prepared and is for the amount of US\$3,050,000 for four years for the conduct of the national program.

Paraguay is a founder member of the Regional Technical Animal Health Committee together with Argentina, Brazil, Bolivia, Chile and Uruguay and has attended all the conferences and international meetings held by this Commission. It is considered necessary to establish bilateral or multi-national agreements both to coordinate Paraguay's efforts with those of its neighboring countries and to adopt a flexible and practical machinery for ensuring adequate supervision of frontier areas.

The vaccines at present being used are imported from Argentina, Uruguay and Brazil. The construction of a production laboratory capable of producing 4 million doses a year is pending as is that of the government control laboratory.

Training required for field and laboratory personnel is estimates as follows:

Laboratory techniques	6 Veterinarians
Campaign operation	10 Veterinarians
Evaluation	2 Statisticians
Administration	2 Economists
Extension work	2 Specialists

Three fellowships for special studies in laboratory work and another in field work have been awarded by the Pan American Foot-and-Mouth Disease Center. In the above-mentioned loan, provision is made for funds to finance eight additional fellowships.



PERU

A national foot-and-mouth disease control program is under way, but the necessary equipment, vehicles and personnel for a nationwide campaign are not available. Stringent financial restrictions in the period 1965-67 had a considerable impact on the program which was initiated in 1963 and which by 1964 had managed to cover almost the whole country. With the assistance of the Pan American Foot-and-Mouth Disease Center a loan application has been prepared for submission to the Inter-American Development Bank.

Most vaccinations are administered in the most important quality zones with the highest cattle density and about 60% of the cattle in those zones are vaccinated. The vaccinations administered in 1967 only covered 36% of the cattle in the country. 80% of the vaccinations were given by government officials and 20% by private veterinarians. Livestock organizations have actively supported the program, as have the civil and military authorities, whenever necessary.

The vaccine used is inactivated trivalent vaccine produced by the government laboratory. Authorization has recently been given for the establishment of a private laboratory. All the batches of vaccine are subject to innocuity and sterility tests, and potency testing in cattle is carried out with a limited number of the series.

A glance at the situation over the last 20 years shows that localized outbreaks of the disease continually occur in different areas of the country and that epizootic waves appear from one to four years and cover several departments, as well as generalized waves that occur at rather regular intervals. The three types of classic viruses and subtypes O1, A26 and A27 are in existence in the country.

It has been estimated that the direct losses caused by the disease amount to 230 million soles annually, excluding indirect losses (which are difficult to evaluate), the social impact, and the work it occasions farmers.

That figure amounts to 5.9% of the annual cattle production and to 5.5% of the value of the production of the four susceptible species. Considering that with adequate plans and programs cattle production could, under optimum conditions, increase by 5% annually, it is obvious that a single outbreak of foot-and-mouth disease is capable of absorbing the total effort of the livestock development program.

Because of its importance to the economy, the control of foot-and-mouth disease has received first priority in the planning of the cattle sector to which in turn A.1 priority has been assigned in the National Council of Economic and Social Development.

Executive Resolutions No. 311/1965 and No. 372 of 20 September 1963 provide for the systematic and compulsory vaccination of livestock. The

Ministry of Agriculture is in charge of the campaign, through the Agrarian Defense and Inspection Department, which in turn delegates it to the Animal Health Section. In the national program which has been prepared and which it is hoped to carry out with external financial assistance, provision has been made for slight institutional changes. The amount of funds needed for the control of foot-and-mouth disease for the following years is estimated as follows:

	<u>Soles</u>
1965	S/. 15,403,000
1966	13,793,200
1967	12,740,000
1968	10,000,000 (forecast)

The cost of the five-year program is equivalent to US\$8,298,023, which would be increased if the construction and expansion of new quarantine stations were taken into account. It is foreseen that in a period of two years this program will be carried out with modified live virus vaccines which would replace the present inactivated vaccine and that it would be necessary to construct and equip a laboratory for that purpose. In addition, new installations for vaccine control laboratories are required. There is an agreement in existence with the Pan American Foot-and-Mouth Disease Center to use, at an early date, a modified live virus trivalent vaccine.

Increased training for field and laboratory personnel is needed, and it is hoped to receive assistance from international agencies in this connection.

For the multinational coordination of the campaign, Peru has two cooperative projects, one with Bolivia and the other with Ecuador which have been approved by the appropriate authorities but which have not yet been signed because of the difficulty in financing the activities which are among the obligations of the agreement. However, priority has been given to vaccination campaigns in frontier areas.

#### VENEZUELA

A national campaign for the systematic, free, and compulsory vaccination of cattle was initiated in June 1950, and has been carried on without interruption since that date. The progress made in 1954/55 made it possible to reduce vaccinations in those two years and to restrict them to border areas, leaving the rest of the country under observation, but illegal traffic in cattle which presented a constant threat of re-infection made it necessary to resume vaccination in the area in which the disease was enzootic.

The country is divided into three areas as follows:

- a) Vaccination area
- b) Freed area, under continuing surveillance and with vaccination only in the event of an outbreak
- c) Clean area

Vaccine production, the despatch of vaccine to vaccination areas, and the diagnosis of specimens are the responsibility of the Veterinary Research Center of the Ministry of Agriculture and Livestock Production. The Livestock Department through the Animal Health Division and its FMD Section plans and prepares the budget for field work; that work is carried out by veterinarians attached to 75 cattle development and animal health bureaus, which also employ 450 vaccinators distributed in different regions. These government personnel administer bivalent modified live virus vaccine, of which all the series are tested for sterility and innocuity and the potency testing of the seed virus strains used in the final preparation of vaccine is a routine activity.

In the last five years an average of 9,080,388 doses of monovalent vaccine (approximately 4.5 million doses of bivalent vaccine) have been administered, and the percentage of vaccinated animals is 57% in the enzootic area, which contains 5,569,711 head of cattle.

Vallee virus type O, subtype O3, appeared in Venezuela in June 1950, and caused the first epizootic which covered the whole country. The existence of Vallee virus A was confirmed in 1951. Both virus O and virus A occur enzootically, and the average number of outbreaks in this area is 36.78 each year. They occur mostly in the wet season when there is more field work and more livestock marketing. The existence of subtype O3 has been confirmed in Venezuela, as has recently, that of subtype O1. In type A virus, the strain known as A Táchira, which appeared in 1953, is not yet classified internationally, and subtype A18 was confirmed in 1962.

The average annual investment in the campaign is approximately 7.5 million bolivars (US\$1.66 million), but if the campaign were not carried out, the average annual losses that would occur have been estimated at 42.5 million bolivars (US\$9 million). The present losses are estimated at 3,000,000 bolivars (US\$666,666).

The nature of the foot-and-mouth disease campaign entails different socio-economic situations for the clean area and the freed area, because of the prohibition of the movement of animals and animal products which give rise to social and political problems.

There is no doubt that the campaign encourages livestock development, reduces losses, and promotes more rapid cattle growth; the educational

impact on livestock producers in the techniques of handling and breeding cattle is also important.

The situation in the clean area and the freed area is of particular interest, since they cover half the territory and contain one-sixth of the total cattle population of the country.

The Ministry of Agriculture and Livestock Breeding gives high priority to the foot-and-mouth disease campaign and in the program budget for the year 1968 the Livestock Department is allotted Bolivars 27,326,657 (US\$6,072,590) of which the Animal Health Section will receive Bolivars 19,487,252 (US\$4,330,500). Of that amount, Bolivars 8,776,825 (US\$1,948,183) are earmarked for the foot-and-mouth disease program, that is to say, 44% of the animal health budget and 32% of that of the Livestock Division.

Additional funds are expended by the Veterinary Research Center, which gives the highest priority to all matters relating to the production of foot-and-mouth disease vaccine, research, and diagnosis. Its present production capacity is 10 million doses, and it is planned to construct a new vesicular diseases laboratory, one to produce inactivated vaccines and to expand the tissue culture laboratory and premises for the testing of vaccines at a cost of approximately Bolivars 3,500,000 (US\$777,777).

The cost of the campaign in the last ten years has been as follows:

1958	Bs. 5,121,403	US\$ 1,138,089
1959	6,849,824	1,522,183
1960	7,687,050	1,708,733
1961	8,140,632	1,809,029
1962	6,692,587	1,487,241
1963	7,153,345	1,589,632
1964	6,954,144	1,545,365
1965	7,260,133	1,613,362
1966	9,521,934	2,115,985
1967	9,598,561	2,133,013
	<hr/>	<hr/>
	Bs. 74,979,603	US\$ 16,552,632

For general arrangements priorities are determined by the Central Bureau for Coordination and Planning, but specific sectoral matters are determined by the Ministry of Agriculture and Livestock Production. Various laws and decrees have been enacted and govern all aspects of the campaign.

It is not planned to apply for loans to finance the campaign, but training is required for laboratory personnel in the preparation of in-activated vaccines, tissue culture, serology, and for field personnel in epizootiology and statistics for which purpose fellowships are being requested.

As to the multinational aspects there are specific agreements which stem from the meetings held in Bogota, 1959; Maracay, 1960, between Colombia, Ecuador, Panama and Venezuela; that of Belem, 1967, agreement with Guayana and Brazil and that of OBSA (Bolivarian Plant and Animal Health Organization) signed by Colombia, Ecuador, and Venezuela.

Foci of vesicular stomatitis in the last five years numbered 81, of which 76 were of the New Jersey type and 4 of Indiana type. The disease is enzootic throughout the country, but its highest incidence is in the central western region; the most affected species is cattle followed by horses.

#### AFFECTED COUNTRIES SUMMARY

- 1) The economy of South American countries depends in most cases on agriculture and in that sector, the livestock industry plays a crucial role, the total number of head of cattle involved being about 180 million.

This area also contains some of the largest exporters of meat and meat products in the world.

- 2) The estimated losses for six out of ten countries of the area range between US\$459 and \$471 million a year.
- 3) About 250 million doses of polyvalent vaccine were produced by 45 laboratories in 1967, which far exceeds the estimated production of 105 millions in 1962.
- 4) The position with regard to foot-and-mouth disease campaigns is as follows:

National campaigns - 4 countries

Partial campaigns - 6 countries

Of the countries with partial campaigns three are about to begin nation-wide campaigns.

- 5) All the governments have acknowledged that foot-and-mouth disease control has the highest priority in the livestock subsector and, with the exception of Venezuela, they need external financial assistance; for that purpose some have already submitted loan applications and others are preparing them.

- 6) As far as multinational activities are concerned, all have understood the need to begin to initiate their national campaign. This understanding is reflected in the various agreements and conventions in force: International Animal Health Agreement (Argentina-Bolivia-Brazil-Chile-Paraguay-Uruguay); Argentina-Chile Commission for the prevention of foot-and-mouth disease in the southern zone of both countries; Colombia-Ecuador Commission for the campaign in frontier areas; Technical Commission for the control of foot-and-mouth disease in Roraima --Brazil-Guyana-Venezuela--Bolivarian Plant and Animal Health Organization. The Pan American Sanitary Bureau has been closely cooperating in all these agreements and treaties through the instrumentality of the Pan American Foot-and-Mouth Disease Center.