

Centro Panamericano de Fiebre Aftosa

SITUATION OF THE FOOT-AND-MOUTH DISEASE CONTROL PROGRAMS. SOUTH AMERICA, 1985

MARCH, 1986



pan american health organization
pan american sanitary bureau, regional office of the
world health organization

SITUATION OF THE FOOT-AND-MOUTH DISEASE CONTROL PROGRAMS SOUTH AMERICA, 1985

1. SITUATION OF THE VESICULAR DISEASES

1.1 GENERAL SITUATION

Vesicular diseases in South America in 1985 affected a total of 5351 herds. This meant an increase of 17% in the number of affected herds, as compared to 1984, and differed from the totals posted in the three preceding years.

Cattle herds affected by vesicular diseases totalled 5262, yielding an affected herd rate of 1.20 per thousand herds. That rate was comparable to the rate recorded in recent years.

The overall populational morbidity caused by vesicular diseases posted a rate of 7.8 animals per 10,000, while lethality in cattle was 2.0%. Internal morbidity in the affected herds was 13%. The two latter indicators yielded values higher in 1985 than in 1984, while populational morbidity declined.

Vesicular diseases affected a total of 196 pig herds; populational morbidity was 2.8 per 10,000 animals, internal morbidity in the affected herds was 17% and lethality 21%. This last rate is a characteristic in the presence of foot-and-mouth disease in swine.

The other animal species susceptible to the vesicular diseases yielded very low percentages.

1189 herds were affected by foot-and-mouth disease (FMD) according to the records (episodes with laboratory diagnosis). That was a 17% increase over 1984, comparable to the frequencies recorded from 1982 on.

With respect to the geographical distribution of the frequency of herds affected by vesicular diseases in South America in 1985, Colombia posted the highest figures for the total as well as for diagnoses positive to FMD and to vesicular stomatitis. The other important situation had to do with FMD in Argentina, for virus type C during the first half of the year.

In South America, Chile, Guyana, French Guiana and Suriname continue free of FMD.

Regarding the types of virus in evidence in 1985, virus type A increased its presence by 116% over 1984. That total was mostly due to the

epidemic situation in Colombia, caused by the appearance of virus A Sabana-Col/85. Virus types O and C showed a downtrend throughout South America in general, despite of high record of type C in Argentina.

There were two frankly epidemic situations during the year in review. One occurred during the first half of the year in Argentina, where the 1984 epidemic situation caused by virus C overlapped into 1985. The second situation involved virus type A in Colombia, starting in the second half of the year.

Vesicular stomatitis in South America in 1985, expressed as the frequency of laboratory diagnoses with identification of the agent, increased considerably (64%) over the 1984 total.

The frequency of New Jersey and especially of Indiana virus, increased substantially in Colombia.

Other regions of America (North America, MesoAmerica, the Caribbean) continue to be free of FMD.

The frequency of both New Jersey and Indiana type vesicular stomatitis declined in comparison to 1984, in Mexico and countries of MesoAmerica.

There were cases of New Jersey type vesicular stomatitis recorded in the United States of America in 1985, from June to October.

1.2 COUNTRY-BY-COUNTRY SITUATION

ARGENTINA

The total number of affected herds recorded in 1985 is comparable to the average in recent years. The frequency during the first half of 1985 was considerably higher (84%) than during the second half. The provinces that reported higher numbers of affected herds were: Buenos Aires, Santa Fé, Córdoba, and La Pampa, in the Humid Pampa region, a secondary endemic region where cattle fattening predominates. Epidemic-level frequencies were reached during the first semester of the year in Salta, San Luis, La Rioja and Tucumán, provinces belonging to paraendemic and occasional ecosystems.

With respect to the types of virus, there was a sharp predominance of virus type C₃ (95%); its presence reached epidemic proportions until mid-year, especially in the Humid Pampa region. Virus types A₇₉ and O₁ were also recorded, the former in a very low frequency of only 5 foci.

Samples were collected in 52% of the affected herds recorded; only in 24% of them was the active virus typified. Morbidity due to FMD was 15.7 per 10,000 and lethality was 1.7%.

In the vaccination conducted in February, 1985, the National Animal Health Service (SENASA) applied together with the trivalent vaccine a monovalent one prepared with the C₈₄ Argentina field strain. This strain later replaced the C₃ Resende in the vaccine formulation.

BOLIVIA

The number of affected herds in 1985 was higher than in the last three years. A large part of those episodes was recorded during the first quarter of the year (65%). The situation in the state of Tarija, bordering Argentina, may have been an extension of what occurred with virus type C in that country's northwestern section.

With reference to the geographic distribution, it should be remembered that the program's coverage is officially restricted to the departments of Santa Cruz de la Sierra and Cochabamba. Nevertheless, in the geographic distribution of FMD in 1985, cases were recorded also in the departments of Chuquisaca, Tarija and La Paz. In relative terms, the cases recorded in the department of Chuquisaca (Central-South of the highland region) were significantly high.

Virus types O₁ and C₃ were identified. Blood samples were taken in only 27% of the herds affected, and virus typification was accomplished in 19% of the recorded episodes.

BRAZIL

The number of affected herds recorded during 1985 was very similar to the number in the preceding two years. The rate of affected herds was less than one per thousand. Populational morbidity in cattle was 3.4 per 10,000 head and lethality reached 1.5%. The attack rate in the affected herds was 17%. The West-Central and Northeast regions were the two regions where vesicular diseases were recorded with greater frequency. The record of FMD in the first region was higher in the first half of the year; in the Northwest frequency was higher in the period from April to September. The frequency continues to decline in the South, thus creating favorable conditions to initiate a phase of eradication of the disease, especially in the state of Rio Grande do Sul. In the West-Central region the three types of virus were recorded; virus type A was predominant over type O. Virus type C was present in this region with a very low frequency. Virus type O clearly predominated over virus type A in the Northeastern region, where there was no report of C virus.

Blood samples were collected from 38% of the affected herds, and the virus type was identified in only 19% of them.

The subtypes identified in Brazil were O₁, A₂₄, A₇₉ and C₃.

Twenty-two foci of vesicular stomatitis were recorded in the state of Minas Gerais in 1985; they were identified beginning in September, characterizing an outbreak in cattle in the South-Central region of this state. The Indiana 3 Alagoas-BR/64 virus was identified.

COLOMBIA

The highest total of herds affected by vesicular diseases in Colombia in the last seven years was reached in 1985 (2072), of which 2042 were episodes in cattle herds.

There were 4.32 cattle herds affected per 1000 herds, and the population morbidity in cattle rose to 22.3 per 10,000. Those were the highest figures reached on the continent in 1985. The internal morbidity in affected herds followed the same pattern, reaching 21.4%, as lethality was 2.9% in cattle.

The situation was equally important with respect to the pig population. 114 pig herds were affected, yielding a population morbidity of 9.1 per 10,000, internal morbidity of 48.2% in the affected herds, with 14.7% lethality.

Heavily affected were the departments of Cundinamarca (the plains of Bogotá), Meta, Boyacá, Santander, Antioquia and Caldas, in the Central region of the country.

During the second half of the year the monthly frequencies of type A foot-and-mouth disease episodes reached epidemic levels. Also, the recorded frequencies of New Jersey and Indiana vesicular stomatitis reached levels beyond all expectations throughout the year, and posted their highest frequencies in the second part of the year. Within this epidemiological panorama virus type A reached a clearly epidemic level, higher than 400% over the 1984 level; its occurrence was highest in the departments of Cundinamarca, Boyacá, Meta and Santander. A strain of virus A was demonstrated A Sabana-Col/85, by virtue of its high frequency on the Bogotá plains (Cundinamarca). Virus type O also produced a high record of presence, especially in the department of Antioquia. Vesicular stomatitis also showed epidemic characteristics in 1985. New Jersey virus posted high frequencies in Santander, Caldas and Antioquia. The Indiana type virus, whose frequency exceeded the 1984 total by 100%, recorded high occurrence in the departments of Santander, Caldas and Huila.

Samples were taken in 58% of the affected herds; the type of virus was identified in 41% of the herds.

The FMD virus subtypes were identified as O₁, A₂₄ and A Sabana-Col/85.

CHILE

Chile continues free of foot-and-mouth disease.

ECUADOR

The recorded frequency of herds affected by vesicular diseases was the lowest in the last seven years, and was 50% below the 1984 total. The affected herds rate was 1 per 100,000, populational morbidity was 7.4 per 10,000, internal morbidity 12%, and lethality less than 1%. Three pig herds were affected, with high internal morbidity and lethality. The majority of episodes was concentrated in the first half of the year. This situation is related to the departments where vesicular diseases produced occurrences of greater proportion, such as Pichincha, especially Los Rios and Guayas. The department of Carchi also recorded frequency of a certain importance, as the episodes in this case were largely concentrated during the second half of the year.

Virus type A predominated (Carchi, Pichincha and Los Rios). A low frequency of vesicular stomatitis was recorded, the only occurrence of considerable magnitude involving New Jersey virus in Pichincha.

More FMD was recorded than vesicular stomatitis. The active FMD viruses were A₂₄ and O₁.

Material was collected in 60% of the episodes and the agent was identified in 45% of them.

FRENCH GUIANA

There was no record of vesicular disease in 1985.

GUYANA

There was no record of vesicular disease in 1985.

PARAGUAY

The 19 episodes of FMD recorded in Paraguay in 1985 were below the average total in the last five years. The majority of the cases occurred in the first half of the year. The affected herds rate was 9.6 per 100,000 (0.096×1000). The populational morbidity was 1.4 per 10,000 cattle, and the internal morbidity rate in the affected herds was 11.7%. Lethality was nil. Four pig herds were also affected.

The geographic distribution of the disease shows that the greater frequency of affected herds was recorded in the department of Presidente

Hayes in the Western region, in the first half of 1985. In that same period the disease was recorded in Boquerón in the same region, and in Caaguazú in the Eastern region.

Virus type C was dominant, occurring mainly in the Western departments of Paraguay. Virus O was recorded to a lesser degree in the department of Caaguazú.

Samples for diagnosis were collected from 68% of the affected herds. In 42% of the affected herds the active agent was identified.

The O₁ and C₃ foot-and-mouth disease virus subtypes were identified.

PERU

The total number of herds affected by vesicular diseases declined slightly in relation to the preceding year. However, the frequency of herds affected by FMD was the highest in the last three years. The monthly frequency in August and September was higher than expected due to the appearance of virus type O foci in the highland near Puno, in the southeastern portion near the Bolivian border.

The rate of cattle herds affected by vesicular diseases reached 2 per 10,000 (0.23×1000) with an internal morbidity of 13.2%. That meant a populational morbidity of 1.5 per 10,000. Lethality was nil. Eight pig herds were affected by vesicular diseases.

The geographical distribution of vesicular diseases shows significant occurrences of FMD in Puno and vesicular stomatitis in San Martín, Cuzco and Ancash.

Foot-and-mouth disease frequency in 1985 was similar to preceding years, while the geographical spread makes the epidemiological situation less favorable in comparison to 1983 and 1984. Nevertheless, FMD continues to be sporadic in Peru.

The Indiana type vesicular stomatitis continues to occur more than New Jersey type, although its frequency in 1985 was lower than the preceding year. Important was its presence in the department of Cuzco, toward the eastern part of the country.

Subtypes O₁ and A₂₄ of FMD were identified, but virus type C was not recorded.

Material for laboratory diagnosis was taken in 43% of the episodes, out of which the virus type was identified in 40%.

SURINAME

No vesicular disease was recorded in 1985.

URUGUAY

The country again recorded a favorable situation as only 21 episodes of FMD were reported in 1985. But the situation still reflected an increase in the number of herds affected, in relation to the 1982-1984 period. The affected herd rate was 4 per 10,000 (0.4×1000), representing a populational morbidity of 1 per 10,000 cattle. The internal morbidity of the affected herds was 6.1%. Lethality was nil. Four pig herds were affected. The monthly frequency in July was sharply higher than expected for that month. The disease was not reported between August and December, and continue to be sporadic in Uruguay.

Geographical distribution indicates that virus type O occurred mainly in the Northern departments of Rivera and Tacuarembó. Virus type C occurred in Paysandú and Colonia on the coast of the Uruguay River and southern part of the country. The identified subtypes were O₁ and C₃.

Material was collected in 100% of the episodes and in 86% of them the virus was identified.

VENEZUELA

The frequency of vesicular disease episodes in 1985 was similar to the 1984 total, and slightly higher than in the first four years of the decade. The record of FMD was similar to the average of the last six years. The rate of cattle herds affected by vesicular diseases reached 0.9 per 1000, the cattle populational morbidity was 2.3 per 10,000, the internal rate of morbidity 11%, and lethality 4.2%. The higher monthly frequencies in 1985 were concentrated in the second half of the year. 53 pig herds were affected, yielding a populational morbidity of 15.6 per 10,000, internal morbidity of 8.7% and lethality of 36.4%.

The states of Anzoátegui, Apure, Zulia, Guárico and Aragua recorded higher frequencies.

There were more occurrence of FMD than vesicular stomatitis. The predominant viruses were respectively type O for FMD and New Jersey for vesicular stomatitis. The latter reached frequencies above those expected in the second half of the year.

Material was collected in 66% of the foci for laboratory diagnosis; 34% of them yielded positive identification.

The FMD virus subtypes identified were O₁ and A₃₂.

2. SITUATION OF THE FOOT-AND-MOUTH DISEASE CONTROL PROGRAMS

2.1 GENERAL SITUATION

The foot-and-mouth disease control programs in South America continued to feel the negative effects of the economic crisis. The basic activities have been maintained: epidemiological surveillance, control of foci and vaccination with vaccines submitted to official control. The gravity of the disease has been diminished and the number of foci, in relation to previous eras, has been significantly reduced.

The official veterinary services continued to be concerned in 1988 with restructuring the national FMD plans, based on the policies and strategies set forth by the South American Commission for the Control of Foot-and-Mouth Disease (COSALFA). This process has been encouraged by the overall results yielded in the control and by the technical accomplishments available today as the product of a better epidemiological awareness of the disease. In some regions of the Plata Basin this has led to greater effectiveness in fighting the disease and a more rational use of resources. The disease's occurrence pattern has thereby been reduced from endemic to sporadic.

Argentina completed preparation of the document for the Argentine Animal Health Plan (PLANARSA). It sets forth the sanitary guidelines for the control and eradication of FMD and other diseases for the next few years. It was approved by Argentine authorities and has been submitted to the appreciation of the Inter-American Development Bank (IDB).

Brazil is introducing changes in the Project for Animal Disease Control, which includes the Second Stage of the Foot-and-Mouth Disease Control and Eradication Plan with the cooperation of the PAFMDC/PAHO. A World Bank mission has announced a trip to Brazil to analyze the document.

Uruguay has drafted a Foot-and-Mouth Disease Eradication Project that has been forwarded to the IDB for possible funding.

Of major importance and encouragement is the situation presently observed in Uruguay and the neighboring Brazilian state of Rio Grande do Sul. That area encompasses some 400,000 properties and a population of approximately 24 million cattle and 33 million sheep. The systematically applied disease-control measures have wrought changes in the regional characteristics of FMD occurrence, which has been brought to an occasional status. This situation is the result of an increasingly more intense use of epidemiological information, especially in the strict control of foci and cattle transit.

The animal health authorities of Argentina, Brazil and Uruguay have committed themselves to executing an eradication program in the Plata Basin area. That encompasses all of Uruguay, the state of Rio Grande do Sul, and Argentine Mesopotamia. The PAFMDC, by request of the interested countries, drew up a specific project for that subregion.

Another aspect worthy of emphasis is Chile's reinstatement as a FMD-free country. Preventive measures continue to be implemented in the summer pasturelands in the mountainous region bordering Argentina. Those measures have been helped by studies on the risks of disease introduction over the border. The studies are based on a detailed characterization of the traditional livestock-raising practices in the mountain region in the summer.

The year in review was characterized by strong activity in the bilateral agreements for the coordination of disease-control activities in the border areas.

The coverage statistics in 1985 were quite similar to 1984:

Geographic coverage	59%
Coverage of cattle herds	90%
Populational coverage	78%

The geographic coverages of the programs in Bolivia, Brazil and Colombia do not encompass those countries' entire territory. For example, the Amazon region in Brazil and Colombia is excluded because the livestock population is still relatively insignificant. The Bolivian program covers only the departments of Santa Cruz and Cochabamba and, beginning in 1983, a pilot area in the department of Beni.

Whereas FMD vaccination strategies in South America differ according to the region, the vaccination coverage is perhaps best expressed in the ratio of doses/head of cattle. This ratio excludes the vaccine applied to sheep in Argentina and Uruguay. In a region where the programs in 1985 cover 78% of the cattle population, 2.3 doses were administered per head of cattle, varying from 0.36 (Ecuador) to 3.38 (Argentina).

482.6 million doses of FMD vaccine were produced and submitted to official controls. 443.3 million doses were approved. The total available quantity was 445.2 million doses. This means a 1% increase in the annual availability of vaccine in South America in 1985, compared to 1984. The PAFMDC produced and distributed 6 million doses of oil-adjuvanted vaccine to the countries.

The number of field operating units in 1985 was more or less comparable to the 1984 total of around 2000 units.

Each field operating unit covered an average of 5088 km², 1978 cattle herds and 91,420 head of cattle.

Available human resources in 1985 were similar to the preceding year, excluding Brazil which did not report in this category. About 85% of the personnel are active in the field, the distribution of professional staff and assistants being similar. The field units have an average of 1.08 professionals and 3.8 assistant staff, and 1.73 vehicles for their activities. The laboratory occupies 7% of the programs' personnel, while 8% staff the central units. Of the operating funds, 74% is assigned to the field operating units, 8% to the laboratory, and 18% to the central unit.

Available funding totalled US\$ 40.5 million dollars (without information from Brazil and Venezuela), of which 78% was spent on operating costs in 1985. In assessing the available funding with respect to the herds, the FMD programs allocate US\$ 10.25 for each herd, disregarding Brazil and Venezuela. In some countries the figures do not include the cost of acquiring and applying the vaccine.

International trade in 1985 was characterized by importation, especially of cattle and cattle semen, and the exchange of horses.

Imports from outside the continent mostly involved genetic material, semen or breeder stock, coming from Europe, North America and New Zealand.

Tables 18 to 34 show the figures corresponding to this chapter.

2.2 COUNTRY-BY-COUNTRY SITUATION

ARGENTINA

The National Animal Health Service (SENASA) covers Argentina's entire livestock population and national territory.

The basic FMD-control strategy continued during 1985: north of the Barrancas and Colorado Rivers, systematic mandatory vaccination of cattle every four months, and of sheep every six months; official buffer vaccination in the northern part of the province of Rio Negro, and Partido de Patagones in Buenos Aires province; strategic and ring vaccination in the rest of Rio Negro and Neuquén; and maintenance of the free area in Chubut, Santa Cruz and Tierra del Fuego.

As a consequence of the epidemic wave of virus type C that has affected Argentina since mid-1983, the Humid Pampa region was affected in 1985, especially during the first half of the year.

SENASA made a concerted effort in 1985 to improve its operating capability to detect foci as well as to control them. SENASA likewise planned and put into practice a new set of regulations on the control of oil-adjuvanted foot-and-mouth disease vaccine. The goal is to establish the conditions required to ensure production of high-quality vaccines. A major part of those concerted efforts was the funding from the government of the province of Entre Ríos for the construction and start-up of an oil-adjuvanted vaccine production plant. The PAFMDC will provide direct co-operation in the project. The Center also continued in 1985 to render technical cooperation to SENASA in the field of epidemiological diagnosis and in FMD control measures.

The private laboratories produced 188.9 million doses of aluminum-hydroxide FMD vaccine. 179.9 million doses (95%) were approved by the official quality control.

Concerning the FMD vaccination, the dosis/head of cattle ratio was 3.38 doses per head, due to the fact that in the first stage a monovalent vaccine of C Argentina/84 was applied together with the trivalent vaccine. Additionally, about 50% of the sheep population in Argentina was also vaccinated.

The service engaged a total of 1606 persons in the 295 field units, i.e., 335 veterinarians and 1271 field assistants and administrative staff. Professional personnel comprise 21% of the total, of which 78% are in the field and 18% in the laboratory. Of the administrative and assistant personnel, 89% work in the field and only 9% in the laboratory.

On the average, each operating unit engaged 0.9 professional staff, 3.8 auxiliary and administrative personnel, and 4.2 vehicles out of the total fleet of 1247. Each unit covered an average of 9387 km², 996 herds and 169,597 cattle. Thus each veterinarian attended an average of 1124 herds and 190,958 head of cattle, while the ratio of field personnel was one to 261 herds and 44,472 head of cattle.

Of the 20 million dollars available to the program in 1985, 96% was earmarked for operating expenses. In relating those figures to the herds, the following ratios can be established: SENASA has US\$ 68.30 for each herd of cattle and US\$ 0.40 for each head of cattle, excluding the vaccine and vaccination costs that are the responsibility of the farmers themselves.

The activities of all the animal health border agreements continued in effect during the year along the border with Chile and in the Plata Basin area bordering Brazil, Paraguay and Uruguay.

The year was characterized by intensified activity in planning and promoting the new FMD eradication program in the country. In this regard in-depth analyses were conducted of the program aspects relative to assessing its social and economic impact for the country, as well as the cost and administrative aspects that will signify the implementation of the new strategies.

Active cooperation from the PAFMDC/PAHO helped to conclude the PLANARSA Project document. In addition to the main objective — achieve eradication of FMD — it also envisages the control of other economically important diseases like brucellosis, tuberculosis, mange, ticks, diseases of horses and pigs. The Plan was approved by the central Government authorities and by the Ministry of the Economy, and was submitted for funding to the Inter-American Development Bank.

BOLIVIA

The area under program, covered by the National Service for the Control of Foot-and-Mouth Disease, Rabies and Brucellosis (SENARB), encompasses the departments of Cochabamba and Santa Cruz, a part of the Department of Tarija on the Argentine border, and a pilot plan in the department of Beni. That accounts for 18.5% of the national cattle population.

SENARB engages 17 field units. In 1984 each field unit average 2.8 veterinarians, 6.1 assistant staff and 1.6 vehicles.

According to the 1984 data, each field unit covered an average of 16,267 km², 1375 herds and 22,529 cattle. Each veterinarian rendered attention to an average of 487 herds and 7979 cattle, while field staff members averaged 259 herds and 4118 cattle.

Bolivia does not produce FMD vaccines. It imports all vaccines and uses oil-adjuvanted vaccine produced by the PAFMDC.

The vaccination activities are complemented with sanitary education activities and control of animal transit.

The bilateral animal health agreement with Brazil held the respective meeting in 1985.

BRAZIL

The National Foot-and-Mouth Disease Control and Eradication Plan (PNCFA) covered 31% of the land surface, 81% of the herds and 66% of the cattle population. The figure referring to the land surface is low because the extensive Amazon region where the animal population is also low, is excluded from the Plan. The Plan is in progress in 20 units of the Federation. Some states in the Northeast, North and East-Central regions remain to be incorporated into the Plan.

Eight private laboratories produced 193,394,900 doses of saponin-aluminum hydroxide adjuvanted inactivated FMD vaccine. That output was 23% lower than in 1984. Additionally, 20,307,145 doses of oil-adjuvanted vaccine were produced and utilized on a priority basis in strategic areas. The official controls approved 177,622,790 doses of traditional vaccine and 8,356,570 doses of oil-adjuvanted vaccine, or 92% and 41% of the output, respectively. The control methods utilized were the BPD₅₀ technique, the percentage of protection against generalized disease on the feet, and, occasionally, the guinea pig C index.

Vaccination coverage reached 884,861 herds (58%) on a dose-to-head of cattle ration of 2.41. In some areas of the country the oil-adjuvanted vaccine used was produced by the Regional Support Laboratory (LARA) in Campinas (São Paulo), by the PAFMDC/PAHO, and by some private laboratories. The vaccination was conducted by the ranchers under the supervision of official personnel.

The program operates 1100 field units covering an average of 2371 Km², 1387 herds and 70,089 head of cattle. Of the 1138 vehicles available, each unit averages 1.03 vehicles.

Regarding international trade in animals in 1985, the most common imports included cattle from Bolivia, cattle semen from various European countries and North America, hog semen from West Germany and France, goats from Europe and Canada, and horses from neighboring countries. The most important exports involved cattle and horses.

During the year 15 veterinarians attended specific courses organized by the PAHO/PAFMDC. In this regard were held courses under PROASA in Administration of Animal Health Programs, Animal Quarantine and Development of Animal Health Programs.

International coordination activities proceeded as meetings were held concerning the animal health border agreements with all neighboring countries. Jointly with Argentina and Uruguay, Brazil concluded the plan of action to eradicate FMD in the Plata Basin.

The project for the second stage of the National Plan has prepared a document, now in the stage of being reviewed, that will be the basis for financing requests to the World Bank.

COLOMBIA

The Foot-and-Mouth Disease Control Program, which is nationwide in scope, directs priority attention to zones because of their geographic location or their livestock-raising importance for national development. Various different strategies have been established according to the regional epidemiological characteristics of FMD in the country. The virus-free area in northern Chocó, with a population of 50,000 head of cattle, applies measures of strict population and mobilization controls, inspects farms on a systematic basis, does not apply any vaccine, and eliminates the animals in case of an outbreak. This area is protected by a buffer-like zone with a million head of cattle where strict programs emphasize control of animal mobilization, epidemiological surveillance, prompt reaction to foci, and massive and systematic vaccination reaching a population coverage exceeding 90%. The goal is to expand the virus-free area eastward to encompass the entire northern coastal area which harbors half of the nation's cattle.

In the economically important livestock areas on the north coast, eastern plains and inter-Andean valleys, vaccination cycles are conducted every 4 months. Varying levels of coverage are accomplished according to the program's progress. In areas of lesser livestock importance, vaccination is done every four months, but not in cycles.

The program's geographic coverage rate is low because it excludes the extensive southeastern Amazon region where the cattle population is negligible.

The only FMD vaccine-producing laboratory — VECOL — produced a total of 33 million doses. 1.8 million were monovalent A Sabana-Col/85 and 314,160 doses were bivalent oil-adjuvanted doses. The major portion of vaccines produced is the bivalent inactivated saponin-hydroxide (O-A) type, with the antigen produced in cell cultures. Of these vaccines, 12.5 million doses were submitted to efficacy control tests in cattle. The rest were tested by indirect means. 31.4 million doses were approved.

The vaccination of cattle can be conducted in various ways, depending on the risk existing in the ecosystem. The ratio of doses to head of cattle in 1985 was 1.95/1 in the Program area.

The Program engaged 172 veterinarians, 290 field and 347 administrative personnel, assigned to 100 field units. 89% of the professionals are in the field, as are 97% of the administrative and assistant personnel. Each field operating unit covers an average of 6867 km², 2887 cattle herds and 160,438 head of cattle. The coverage per veterinarian was 2568 herds and 104,861 cattle, and 800 herds and 25,689 cattle per field staff member. The personnel dedicated 70% of their time to the FMD program.

Each of the 365 vehicles available covers, on the average, 1881 km², 1210 herds and 43,956 head of cattle.

The Program had an allocation of US\$ 12.8 million in 1985; 45% was expended on operating costs and 55% on capital costs. The funding was provided by public and private sources.

The cattle owners themselves made up the private source (54%) through their purchases and application of the FMD vaccines.

The US\$ 11.5 million spent in the field yielded \$20.00 for each cattle herd and \$0.72 per head.

In 1985 Colombia imported 374 cattle from the USA, Canada, Ecuador and Costa Rica; 423 pigs from the USA, and 85 horses from the USA, Argentina, France, Spain and Ecuador. The outstanding exports involved cattle shipped to Curaçao and Venezuela.

Regarding international coordination activities, meetings were held by the animal health border commissions of the agreements with Brazil, Ecuador and Venezuela.

Although the epidemic situation experienced in 1985 halted the approval and funding of the Program's Stage II, it should serve to point out the need to reactivate the Program.

CHILE

The country is free of FMD and carries on a prevention program that covers the whole nation, its 757,720 km², and susceptible populations of 3,818,682 cattle, 5,678,325 sheep, 1,134,516 goats, 890,781 pigs and 100,173 camelidae. A strong element of the Program is the epidemiological surveillance system for prevention, and the control of inbound animals, products and byproducts of animal origin at ports, airports and border check stations.

The Program's strategy is based on a situational diagnosis of the risks of introducing FMD and other exotic diseases over the borders, or through ports and airports. The data compiled in the 13 regions into which the country is subdivided are processed for use in the exotic diseases program. This activity has received technical cooperation from the PAFMDC/PAHO.

The Program also continued the activities of population control and sampling of anti-VIA antibodies in the livestock that utilize the summer pastures in the Andes.

The nation consolidated its status as a FMD-virus free country in 1985, after eradicating the outbreak that occurred in the second half of 1984.

Chile has a permanent stock of 50,000 doses of emergency vaccine on hand at the PAFMDC.

The FMD Prevention Program in Chile engages 62 veterinarians and 121 field and administrative personnel in 56 field units. The average coverage of each field operating unit was 13,530 km², 3376 cattle herds, and 68,191 head of cattle. 98% of the human resources are engaged in the field, where each veterinarian covers an average of 3150 herds and 63,645 cattle, and each field employee 1588 herds and 32,090 cattle. The Program's ordinary funding amounted to US\$ 505,215, of which 98% covers operating costs. Of that total, 93% was allocated to the field units.

The Exotic Diseases Prevention and Emergency Program of the Livestock Protection Division of the National Agriculture and Livestock Service (SAG) intensified its professional-training activities. This was especially true in the area of epidemiological surveillance and computerized services applied to sanitary aspects. The educational program envisaging community involvement in emergencies also moved ahead. Work is also underway to discourage the use of the summer highland pastures in some regions, in order to reduce the risk of bringing the FMD virus in through the Andes.

The border commission of the bilateral animal health agreement with Argentina held its regular meetings.

ECUADOR

The National Animal Health Program covers the entire country and its livestock population of 3,200,000 cattle distributed into 599,754 herds.

The predominant risk factors in the spread of FMD in 1985 continued to be the uncontrolled mobilization of animals and the low FMD vaccination coverage.

The Program had available 1,146,900 doses of vaccine, of which 500,000 were imported. The latter amount included the 300,000 doses of oil-adjuvanted vaccine supplied by the PAFMDC. The low level of the vaccination coverage of the cattle population in the program is expressed in the dosis/head of cattle ratio of 0.36.

The Program operated 55 field units with 104 professional staff and 155 assistants. The average coverage of each field unit was 5156 km², 10,905 cattle herds and 58,189 head of cattle. 48 vehicles were available to the program. In Ecuador, 82% of the personnel are in the field. Of the professional staff, 24% are engaged at the Program's central unit.

Available funding totalled US\$ 1,220,000. 95% of that amount corresponded to operating expenses, and 87% of all the budget was allocated to the field.

The border sanitary agreement with Colombia proceeded actively and activities under the agreement with Peru were also developed.

No significant steps were taken during the year with respect to the project for the Second Stage of the Foot-and-Mouth Disease Control Program.

PARAGUAY

The Foot-and-Mouth Disease Control Program of the National Animal Health Service (SENACSA) covers the entire nation and the cattle population.

The control strategy consists of massive immunization, sanitary control of animal mobilization, and active epidemiological surveillance. In some regions with endemic characteristics oil-adjuvanted FMD vaccine has been utilized.

Two private laboratories produced 7,755,310 doses that were submitted to official SPI and SNI control testing. All were approved. Additionally, the Program imported 1,000,000 doses of oil-adjuvanted vaccine produced by the PAFMDC.

The oil-adjuvanted vaccine continues to be used in the pilot project of the Mennonite Settlements Caapucú and Quayquyhó in the Western region, as well as on dairy farms near Asunción and around the Central Laboratory.

The Program engaged 126 professional staff and 453 administrative and assistant personnel. It operated 43 field units provided with 65 vehicles. 31% of the human resources are engaged at the Program's central unit and 54% in the field. Each field unit covered an average of 9459 km², 4585 cattle herds and 167,709 head of cattle. The coverage by field veterinarians averaged 3390 herds and 124,336 cattle. The 1985 budget was

US\$ 2.78 million, of which 79% was for operating expenses. 47% of the funding was allocated to work in the field.

Activities under the animal health border agreements with Argentina and Brazil proceeded with the exchange of information and trips on the border.

A five-year FMD control program was prepared and defined the eradication goals that are to be met in the next few years.

In compliance with recommendations issued by COSALFA, the Program continues applying animal health standards for the various livestock-expansion programs presently underway in the country.

International trade records showed significant importation of cattle from Argentina, Brazil and Uruguay, sheep from Argentina, and horses from Uruguay.

PERU

The Foot-and-Mouth Disease Control Program encompasses the entire nation.

The official laboratory produced 1,448,940 doses of FMD vaccine. 100% of the output was submitted to and approved for use by the C index test.

Vaccination is limited to cattle and is done in three cycles in the departments having the greatest risks of FMD — the borders with Ecuador, Bolivia, north coast, Lima and Arequipa; and two cycles in southern Peru, the jungle, and northern and central sierra. Vaccination is not given on a regular basis in the departments of Ayacucho, Huancavelica, Apurimac, Cuzco and Madre de Dios, where only livestock in transit is vaccinated. The population vaccination coverage was rather low, since the dose/head of cattle rate was 0.43.

The Program staff totalled 101 veterinarians, 413 field and administrative personnel. 97% of the personnel work in the field. 145 vehicles were available, of which 116 are assigned to the 144 field offices. The material and human resources also provide other animal health activities. The average coverage of each local unit was 8903 km², 3216 cattle herds and 23,552 head of cattle. The average coverage per field veterinarian was 4876 herds and 35,700 cattle.

The official budget allocated US\$ 208,214 in 1985, all for operating expenses. That amount yielded US\$ 0.45 per cattle herd and US\$ 0.06 per head of cattle under the program.

International trade records reflected imports of cattle from Chile, USA, New Zealand and Uruguay, and of pigs from Canada and Germany.

URUGUAY

The General Board of Veterinary Services proceeded with the FMD Control Program throughout Uruguay, covering 100% of the cattle and sheep population.

The animal health control policy is based on massive immunization, prompt attention to foci and epidemiological surveillance. The goal is to achieve full eradication of the disease over the short term. FMD has been limited to sporadic occurrence in Uruguay.

The annual vaccine production was 28,335,180 doses. 27,826,180 doses were approved by official controls, and 485,000 doses were exported. The populational coverage in two vaccination stages, and one specifically for calves, was 72.34%. It should be noted that the periods of vaccination were altered nationally: two general vaccinations of the cattle population are now conducted in the first two weeks of May and November, and only calves are vaccinated in March. The annual massive vaccination of sheep is still done in December and January. Considering these vaccination schemes, the dose/head of cattle ratio in 1985 was 1.76/1.

The Program engaged 90 professional staff and 573 administrative and other personnel. 71% of the personnel are assigned to the 41 field units. A total of 113 vehicles was available, and each field unit averaged 1.6 professional staff, 9.8 assistant and administrative personnel, and 2.8 vehicles. The average field unit covered 3963 km², 1280 cattle herds and 236,707 head of cattle.

The Program received US\$ 2,373,400, of which 100% was for operating expenses. 72% of the operating costs was allocated to the field units. Uruguay therefore spent US\$ 46.30 per cattle herd and US\$ 0.25 per head of cattle under the program. The ranches themselves covered the costs of vaccine and vaccinations.

Meetings were held in 1985 with animal health personnel from Argentina and Brazil within the framework of the border sanitary agreements. The "Manual of Procedures for Joint Action in the Agreement Area" was approved and a plan of action was drafted for the eradication of FMD in the Plata Basin.

Regarding international trade in animals, records show that in 1985, as in previous years, Uruguay was mainly an exporting country. Exports were: cattle to Argentina, Bolivia and Paraguay; sheep to Peru; horses, mainly to Argentina, Brazil, Italy and Paraguay.

VENEZUELA

The Animal Health Division conducts the Foot-and-Mouth Disease Control Program throughout the entire country. The Program is based on epidemiological surveillance, prompt attention to outbreaks and vaccination with modified-live-virus vaccine produced by the Ministry of Agriculture and Livestock.

The Program in 1985 had available 8,383,150 doses of modified live-virus vaccine and 1,025,900 doses of inactivated vaccine, which included 425,900 oil-adjuvanted inactivated vaccine provided by the PAFMDC. The overall vaccination populational coverage was low if we consider that the dose/cattle ratio was 0.81/1. But it must be borne in mind that the coverage by districts and vaccination areas is variable, according to the control strategies established in accordance with the regional characterization of the livestock raising activity and the type of vaccine utilized. Vaccination is conducted by official personnel and authorized private veterinarians. The inactivated vaccine is utilized in areas where FMD presence is sporadic.

The Program continues strict quarantine control at 11 international airports, 23 international ports, 8 border stations and 11 postal customs offices.

The Animal Health Division operates through 143 field offices and engages 186 professional staff and 214 assistant and administrative personnel. 325 vehicles are in the automotive fleet. The field units therefore have an average of 1.3 professionals and 1.5 assistant and administrative staff. 95% of the personnel are engaged in the field.

Each local unit covered an average of 6377 km², 1120 cattle herds and 80,944 head of cattle. The average field veterinarian attended 915 herds and 66,143 head of cattle. The animal health service personnel cover all sanitary aspects of the livestock sector. The 1985 budget amounted to US\$ 305,647.8 for capital and operating costs.

Construction proceeded on the inactivated-vaccine production laboratory that will be the cornerstone for the reformulation of the disease-control program.

3. CONTINENTAL VESICULAR DISEASE SURVEILLANCE AND INFORMATION SYSTEM: RESULTS AND PERFORMANCE

3.1 RESULTS

As in previous years, the behavior of the vesicular diseases in the South American countries in 1985 was continuously monitored by means of a system of indicators that enable analysis to characterize and interpret their levels of occurrence and the behavior of the virus types. The historical series of vesicular disease occurrences stored in the PAFMDC computer has been utilized to interpret the significance of the weekly frequencies of vesicular disease presence on a grid map and the frequency of affected herds, by virus types, by each country's political and administrative subdivisions, and total.

Figure 1 shows that in Argentina and Colombia there was a significant number of grid squares where vesicular diseases were recorded for more than 15 weeks of the year in 1985. The same situation was recorded in only two grid squares in northeastern Brazil and in the North-Central region of Venezuela.

In the last five years, the number of grid squares on the map of South America where disease was recorded for more than 15 weeks has been kept at a low level, that is, from 1 to 3% of all the grid squares of the continent. These figures are lower than those recorded from 1978 to 1980.

Table 5 shows for each country of the continent the months when the recorded frequency of herds affected by some type of virus significantly exceeded the expected frequencies. The most characteristic situation in this sense was found in Colombia in 1985, where the frequency of FMD virus type A and both types of vesicular disease viruses was very high. The other critical situations occurred in Argentina, due to virus C — an extension of the 1984 situation — and in Venezuela where, in the second half of 1985, New Jersey vesicular disease occurred significantly.

3.2 PERFORMANCE

This chapter evaluates the operating performance of the transmittal of communications within the Continental Epidemiological Information System, especially in terms of the regular flow of information between the national animal health services in South America and the PAFMDC.

3.2.1 Communications of Alert

Reports of alert were frequently telexed in 1985 to several countries of the region to warn them of the appearance of vesicular diseases in neighboring countries' areas near their borders, and to inform of disease occurrence in previously unaffected areas. Alerts were also sent to other

agencies, the veterinary services of the European Economic Community (EEC) and to the World Reference Laboratory in Pirbright, England.

3.2.2 Weekly transmittal of information on the presence of vesicular disease, by grid squares

The personnel engaged in the national programs is aware that the map of each South American country has been subdivided into a grid map based on geographic coordinates. The grid map serves as a guide for a weekly telex communication of the presence of vesicular disease (regardless of the number of episodes). A numerical code is employed to indicate both the week reported and the grid squares affected. The PAFMDC prepares the code annually and distributes it to the countries at the beginning of each year. The telexed notice from the reporting countries then serves as data input for the PAFMDC's epidemiological file stored in a Digital 1134 computer. The PAFMDC issues a weekly printout named the Weekly Epidemiological Report for distribution to the South American countries and others.

a) - Reporting level

The reporting level of the weekly communications from the South American countries in 1985 was almost 100%, a high level in relation to preceding years: 1984 (98%), 1983 (99.6%), 1982 (97%), 1981 (96%), 1980 (99%) and 1979 (97%). The average of weekly communications received by the PAFMDC was 53 for the 53 weeks of the codified report calendar.

All the countries improved their reporting performance over the 1984 level (Table 35).

b) - Publishing level

Considering the data received at the PAFMDC, all the weekly reports were published (100%). This was better than the 1984 level, by virtue of the fact that the PAFMDC even published weekly information that was received late.

c) - Prompt transmittal of weekly communications

No country improved on its 1984 record. Argentina and Bolivia were significantly less prompt in transmitting their reports.

3.2.3 Monthly information on vesicular disease episodes and their laboratory diagnosis

This information reports the number of herds affected, according to each country's political and administrative divisions, and the number of affected herds from which specimens were collected, according to the virus types identified.

a) - Reporting and publishing levels

In general, both the reporting and publishing levels declined in comparison to the 1984 levels (Table 36).

Bolivia, Brazil, Colombia, Paraguay and Venezuela all maintained their good reporting and publishing performance. The levels for Argentina, Ecuador and Peru slipped. Uruguay continues with its monthly series incomplete at the close of the year. The PAFMDC continued its policy of including the overdue months in any of the numbers of Volume 17 of the Monthly Epidemiological Report, which improves the publishing level.

b) - Monthly reporting delays

In general, the countries of the continent were slower in transmitting their Monthly Epidemiological Report to the PAFMDC (Table 37). Only Paraguay and Uruguay were more punctual and shortened their delays. But the latter country still has substantial delays. Brazil and Colombia maintained their acceptable reporting levels.

In general, the monthly reporting system continues to suffer from the shortcomings noted in previous evaluations. Delays in transmitting reports to the Center have worsened. The failure to provide the epidemiological comments required for interpreting the data, and the failure to locate the virus types on the grid square map, have persisted.

3.2.4 Surveillance activities: laboratory confirmation

Sample specimens were collected for laboratory diagnosis in approximately half of the total number of herds with animals showing clinical symptoms of vesicular disease in 1985. Argentina, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela recorded favorable performance in this field work. On the other hand, Bolivia and Brazil posted low levels of specimen collection. The level of specimen collection is generally low (Table 38).

Regarding the identification of virus types, this was accomplished in less than one out of three episodes having clinical signs of vesicular disease (29%). This result in itself reflects a situation of concern with respect to a very important aspect of epidemiological surveillance.

Uruguay's situation is good, but both Brazil and Bolivia present very low results.

The monthly communication of information on the active virus subtypes must be improved. This is an important requirement for information to the COSALFA countries, to international bodies and to other countries.

3.2.5 Expansion of procedures in the foot-and-mouth disease-free area

The Continental Vesicular Disease Epidemiological Surveillance and Information System has regularly and systematically included Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama — where vesicular stomatitis is endemic — in the system of weekly telexed communications based on grid maps. The Vesicular Disease Laboratory (LADIVES) continues operating normally in Panama. It now sends to the PAFMDC monthly reports on the virus typification, and geographically locates them in the department or province wherein occurred the episode whose virus has been typified.

3.3 RECOMMENDATIONS

Continue to emphasize the following:

- a) - Carefully maintain and improve the epidemiological information system that is a valuable working asset for all the countries of the continent, a precious mechanism of support to the programs, and one of the most important animal health accomplishments in South America. Every possible effort must be made to prevent a decline in the system and its performance.
- b) - Transmit the weekly and monthly epidemiological reports more punctually to the PAFMDC.
- c) - Carefully ensure that the information generated by the system is timely, reliable, up-to-date and is transmitted in accordance with the prescribed forms and standards.
- d) - Make greater use of the information as an objective base for the epidemiological characterization of FMD and subsequent readjustment of the overall control goals and strategies, such as the monitoring and solving of epidemic situations.
- e) - Include monthly information on identified subtypes and locate the identified types on the map.
- f) - In the case of epidemic situations, keep the PAFMDC permanently informed. It is the reference body for consultation by the neighboring countries, international agencies and other countries. On a weekly basis at least, complete information should be forwarded not only showing the affected grid squares, but also the number of foci and typification by grid squares. If a variant appears, indicate the grid squares where it is being identified. Additionally, the reports should also include the degree of morbidity that is being recorded.

g) - Encourage greater integration between the laboratory and the central and field-level epidemiologists, in pursuit of the correct inclusion of the information on types and subtypes and their repercussion on FMD epidemiology.

TABLE 1. Number of herds affected by vesicular disease, and causal agent.
South America, 1985.

Country	Affected herds	Affected herds with samples collected	Diagnosis				
			Foot-and-mouth disease			Vesicular stomatitis	
			O	A	C	New Jersey	Indiana
Argentina	1289	674	10	5	288	-	-
Bolivia	48	13	6	-	3	-	-
Brazil	1524	579	127	113	25	-	23
Chile	-	-	-	-	-	-	-
Colombia	2072	1208	98	402	-	231	125
Ecuador	65	39	5	16	-	7	1
Paraguay	19	13	1	-	7	-	-
Peru	105	45	7	11	-	5	19
Uruguay	21	21	15	-	3	-	-
Venezuela	208 ¹	137	31	16	-	22	1
Total	5351	2729	300	563	326	265	169

1/ Outbreaks with several species affected in a same herd are included.

TABLE 2. Herds affected by foot-and-mouth disease according to type of virus, by country and year. South America, 1985.

Country	Type of virus	1979	1980	1981	1982	1983	1984	1985
Argentina	O	64	44	64	13	351	90	10
	A	178	339	429	39	23	6	5
	C	91	37	22	4	196	348	288
Bolivia	O	59	9	2	-	1	3	6
	A	2	5	3	3	1	8	-
	C	-	2	7	7	3	1	3
Brazil	O	775	645	218	85	61	82	127
	A	402	410	731	589	190	144	113
	C	22	9	18	13	22	19	25
Colombia	O	445	263	87	50	192	164	98
	A	87	76	99	79	32	78	402
	C	-	-	-	-	-	-	-
Chile	O	-	-	-	-	-	13	-
	A	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-
Ecuador	O	64	23	12	9	66	13	5
	A	16	31	35	35	47	29	16
	C	-	-	-	-	-	-	-
Paraguay	O	77	3	5	6	11	22	1
	A	1	-	1	13	1	-	-
	C	11	-	-	1	-	6	7
Peru	O	4	-	4	-	-	-	7
	A	30	24	2	6	1	4	11
	C	-	49	1	7	3	-	-
Uruguay	O	91	127	4	1	-	10	15
	A	7	6	14	2	1	-	-
	C	-	-	-	-	4	6	3
Venezuela	O	38	19	29	28	13	18	31
	A	23	18	22	13	10	7	16
	C	-	-	-	-	-	-	-

TABLE 3. Foot-and-mouth disease virus subtypes identified by country. South America, 1985.

Argentina	O ₁	A ₇₉	C ₃
Bolivia	O ₁	-	C ₃
Brazil	O ₁	A ₂₄ , A ₇₉	C ₃
Colombia	O ₁	A ₂₄ , A _{88b/85}	-
Ecuador	O ₁	A ₂₄	-
Paraguay	O ₁	-	C ₃
Peru	O ₁	A ₂₄	-
Uruguay	O ₁	-	C ₃
Venezuela	O ₁	A ₃₂	-

TABLE 4. Strains used for production of foot-and-mouth disease vaccine. South America, 1985.

Country	S t r a i n s		
	O	A	C
Argentina	O ₁ Caseros O O ₁ Campos	A Arg/79	C ₃ Arg/84
Brazil	O ₁ Campos	A ₂₄ Cruzeiro y A Venceslau	C ₃ Indaial
Colombia	O ₁ Campos	A ₂₄ Cruzeiro	-
Ecuador	O ₁ Urubamba	A ₂₄ Cruzeiro	-
Paraguay	O ₁ Campos	A ₂₄ Cruzeiro	C ₃ Resende
Peru	O ₁ Urubamba	A ₂₄ Cruzeiro	C ₃ Resende
Uruguay	O ₁ Campos	A ₂₄ Cruzeiro	C ₃ Resende
Venezuela ¹	O ₁ Campos	A ₃₂ Venezuela	-

1/ The only country which produces attenuated-live-virus vaccine.

SOURCE: PAFMDC Diagnosis and Reference Laboratory and reports sent by the countries.

TABLE 5. Months when the recorded frequency of herds affected by some type of virus significantly exceeded the expected frequencies. South America, 1985.

Month	Argentina	Bolivia	Brazil	Colombia	Ecuador	Paraguay	Peru	Uruguay	Venezuela
January	C			NJ,I					
February	C			NJ,I					
March	C			NJ,I					
April	C			NJ,I					
May	C			A,NJ,I					
June	C			A,NJ,I					NJ
July	C			A,NJ,I					NJ
August	C			A,NJ,I					NJ
September	C			A,NJ,I					NJ
October	C			A,NJ,I					NJ
November				A,NJ,I					NJ
December				A,NJ,I					NJ

TABLE 6. Vesicular disease morbidity in cattle. South America, 1985.

Country	Herds		Population			Rates				
	Total	Afect. (x 1000)	Total In affected herds	Diseased	Deaths	Herds affected (0/00)	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)	
Argentina	293711	1289	50031.0	824978	78370	1341	4.39	15.66	9.50	1.71
Bolivia ¹	48902	48	1628.0	4745	310	18	0.98	1.90	6.53	5.81
Brazil	1877894 ³	1524	116664.8	226809	39252	590	0.81	3.36	17.3	1.50
Colombia	468679 ⁴	2042	24948.5	259771	55611	1628	4.36	22.29	21.41	2.93
Chile	189044	-	3818.7	-	-	-	-	-	-	-
Ecuador	599754	65	3200.4	19752	2351	21	0.11	7.35	11.90	0.89
Paraguay	197164 ²	19	7211.5	8882	1041	-	0.10	1.44	11.72	-
Peru	463182	105	3391.5	3877	514	-	0.23	1.52	13.26	-
Uruguay	52460 ⁵	21	9705.0	17770	1088	-	0.40	1.12	6.12	-
Venezuela	160173	149	11575.0	24405	2673	111	0.93	2.31	10.95	4.15
Total	4350963	5262	232174.4	1390989	181210	3709	1.21	7.80	13.03	2.05

1/ Cochabamba and Santa Cruz only.

2/ Figure taken from country report to COSALFA XII.

3/ Does not include figure for: Amazonas, Pará, Maranhao, Piauí, Amapá and Rondonia.

4/ Does not include figure for: Caquetá, Chocó, Arauca, Putumayo, Amazonas, Guainia, Guaviare, Vaupés, Vichada and Islas San Andrés.

5/ Data estimated by the PAFMDC.

TABLE 7. Vesicular disease morbidity in swine South America, 1985.

Country	No. of herds affected	Population				Rates			
		Total (x 1000)	In affected herds	Diseased	Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)	
Argentina	...	3800.0	19944	3423	173	9.01	17.16	5.05	
Bolivia	10	278.9	232	200	-	7.17	86.21	-	
Brazil	...	33176.0	11684	4435	938	1.34	37.96	21.15	
Colombia	114	1939.5	3662	1765	259	9.10	48.20	14.67	
Chile	-	890.8	-	-	-	-	-	-	
Ecuador	3	3520.0	757	253	100	0.72	33.42	39.53	
Paraguay	4 ²	1350.0 ¹	212	118	-	3.59	55.66	-	
Peru	8 ²	2141.9	256	36	5	0.17	14.06	13.89	
Uruguay	4	200.0	51	1	-	0.05	1.96	-	
Venezuela	53	2532.8	45464	3957	1440	15.62	8.70	36.39	
Total	196	49829.9	82262	14188	2915	2.85	17.25	20.55	

1/ FAO Production Yearbook, Vol. 37, 1983.

2/ Affected bovine herds.

... No information.

TABLE 8. Vesicular disease morbidity in sheep. South America, 1985.

Country	Population				Rates			
	Total (x 1000)	In affected herds	Diseased	Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)	
Argentina	30939.0	124365	1432	44	0.46	1.15	3.07	
Bolivia	1105.4	11	-	-	-	-	-	
Brazil	18588.0	4947	616	58	0.33	12.45	9.42	
Colombia	2335.9	1574	48	2	0.21	3.05	4.17	
Chile	5678.3	-	-	-	-	-	-	
Ecuador	1259.0	-	-	-	-	-	-	
Paraguay	440.0 ¹	46	13	-	2.55	28.26	-	
Peru	15294.2	1004	19	1	0.01	1.89	5.26	
Uruguay	22164.0	27361	-	-	-	-	-	
Venezuela	309.5	68	19	-	0.61	27.94	-	
Total	98113.3	159376	2147	105	0.22	1.35	4.89	

1/ FAO Production Yearbook, Vol. 37, 1983.

TABLE 9. Vesicular disease morbidity in goats. South America, 1985.

Country	Population				Rates			
	Total (x 1000)	In affected herds	Diseased	Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)	
Argentina	4580.0 ¹	-	-	-	-	-	-	-
Bolivia	88.5 ²	-	-	-	-	-	-	-
Brazil	9037.0	1325	290	10	0.32	21.89	3.45	
Colombia	654.9	516	1	-	0.02	0.19	-	
Chile	1134.5	-	-	-	-	-	-	
Ecuador	268.0	-	-	-	-	-	-	
Paraguay	145.0 ³	25	1	1	0.40	4.00	100.00	
Peru	2021.4	176	-	-	-	-	-	
Uruguay	12.0 ³	-	-	-	-	-	-	
Venezuela	1057.4	-	-	-	-	-	-	
Total	18998.7	2042	292	11	0.40	14.30	3.77	

1/ Figure taken from country report to COSALFA XII.

2/ Figure taken from country report to COSALFA XI.

3/ FAO Production Yearbook, Vol. 37, 1983.

TABLE 10. Vesicular stomatitis morbidity in horses.South America, 1985.

Country	Population			Rates		
	Total (x 1000)	In affected herds	Diseased Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)
Argentina	5305.0 ¹	-	-	-	-	-
Bolivia	1326.0 ¹	-	-	-	-	-
Brazil	8405.0	-	-	-	-	-
Colombia	2830.0	4322	83	0.29	1.92	-
Chile	478.0 ¹	-	-	-	-	-
Ecuador	322.0	-	-	-	-	-
Paraguay	373.0	-	-	-	-	-
Peru	1326.6	169	3	0.02	1.78	-
Uruguay	453.2	-	-	-	-	-
Venezuela	452.8	209	12	0.27	5.74	-
Total	19271.6	4700	98	0.07	2.09	-

1/ FAO Production Yearbook, Vol. 37, 1983.

TABLE 11. Monthly distribution of bovine herds affected by vesicular diseases.
South America, 1985.

Country/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	419	301	94	55	123	100	55	42	47	36	6	11	1289
Bolivia	20	7	4	-	1	-	-	4	-	12	-	-	48
Brazil	187	112	103	99	199	137	122	142	146	105	117	55	1524
Colombia	76	78	70	44	41	202	344	316	241	248	206	176	2042
Ecuador	3	6	14	13	6	5	1	2	5	7	2	1	65
Paraguay	4	3	-	2	3	1	-	-	3	1	2	-	19
Peru	3	3	2	9	2	2	6	13	15	4	-	46	105
Uruguay	-	-	1	2	3	3	12	-	-	-	-	-	21
Venezuela	6	6	5	1	7	15	20	28	24	23	11	3	149
Total	718	516	293	225	385	465	560	547	481	436	344	292	5262

TABLE 12. Monthly distribution of bovine herds affected by FMD virus "0".
South America, 1985.

Country/ /Mounth	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	2	-	2	2	1	1	-	2	-	-	-	10
Bolivia	2	-	-	-	-	-	-	3	-	10	-	-	15
Brazil	1	4	5	16	19	15	11	19	22	6	5	4	127
Colombia	3	1	1	-	-	3	22	18	13	12	8	8	89
Ecuador	-	-	2	-	-	1	-	-	2	-	-	-	5
Paraguay	1	-	-	-	-	-	-	-	-	-	-	-	1
Peru	-	-	-	-	-	-	-	3	4	-	-	-	7
Uruguay	-	-	1	2	1	3	8	-	-	-	-	-	15
Venezuela	-	1	2	1	-	1	2	3	3	3	3	-	19
Total	7	8	11	21	22	24	44	46	46	31	16	12	288

TABLE 13. Monthly distribution of bovine herds affected by FMD virus "A".
South America, 1985.

Country/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	-	3	1	-	-	-	1	-	5
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	36	19	12	4	9	4	6	10	7	2	3	1	113
Colombia	11	9	2	1	8	51	91	72	49	50	22	34	400
Ecuador	1	3	2	2	2	1	-	1	2	2	-	-	16
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	3	2	-	3	1	1	1	-	-	-	-	-	11
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	1	1	-	-	-	1	1	-	4	2	-	1	11
Total	52	34	16	10	20	61	100	83	62	56	26	36	556

TABLE 14. Monthly distribution of bovine herds affected by FMD virus "C".
South America, 1985.

Country/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	40	39	27	16	48	40	23	17	22	7	2	7	288
Bolivia	1	2	-	-	-	-	-	-	-	-	-	-	3
Brazil	6	2	4	-	1	2	1	-	-	5	2	2	25
Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay	2	1	-	1	2	-	-	-	-	-	1	-	7
Peru	-	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	-	-	-	-	2	-	1	-	-	-	-	-	3
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	49	44	31	17	53	42	25	17	22	12	5	9	326

TABLE 15. Monthly distribution of bovine herds affected by vesicular stomatitis,
New Jersey type. South America, 1985.

Country/ /Mounth	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	13	27	25	18	9	11	39	34	17	10	7	14	224
Ecuador	1	2	1	2	-	-	-	-	-	1	-	-	7
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	1	2	1	-	-	-	-	-	-	1	5
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	1	-	1	-	1	4	-	-	-	4	-	-	11
Total	15	29	28	22	11	15	39	34	17	15	7	15	247

TABLE 16. Monthly distribution of bovine herds affected by vesicular stomatitis, Indiana type. South America, 1985.

Country/ /Mounth	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	-	1	-	-	-	-	-	-	6	4	9	3	23
Colombia	9	11	9	7	2	5	13	8	11	11	17	20	123
Ecuador	-	-	-	-	1	-	-	-	-	-	-	-	1
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	1	-	2	-	1	3	-	5	1	-	6	19
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	1	-	-	1
Total	9	13	9	9	3	6	16	8	22	17	26	29	167

TABLE 17. Number of herds affected by vesicular stomatitis,
according to country and virus type.
Central America, Panama and Mexico, 1985.

Country	Vesicular Stomatitis		No Diagnosis (Negative)	Total
	New Jersey	Indiana		
Belice	-	-	-	-
Costa Rica	23	2	12	37
El Salvador	8	0	3	11
Guatemala	6	6	21	33
Honduras	13	3	12	28
Mexico	12	0	19	31
Nicaragua	8	0	2	10
Panama	6	0	8	14

SOURCE: Laboratory of the Regional Vesicular Disease Epidemiological
Surveillance Project for Central America and Panama.

TABLE 18. Coverage by programs for the prevention of FMD. South America, 1985.

Country	Area (Km ²)		Bovine herds		Bovine population (x 1000)	
	Total	Program	Total	Program	Total	Program
Argentina	2769237	2769237	293711	293711	50031.0	50031.0
Bolivia	1098581	276550 ¹	48902	23880	4335.4	400.0
Brazil	8511970	2608624 ²	1877894 ²	1526227 ²	116664.8 ²	77098.4 ²
Colombia	1141748	686743	498679 ³	441818 ³	24948.5	16043.8 ⁴
Chile	757720	757720	189044	189044	3818.7	3818.7
Ecuador	283560	283560	599754	599754	3200.4	3200.4
Paraguay	406756	406756	197164 ⁵	197164	7211.5	7211.5
Peru	1282120	1282120	463182	463182	3391.5	3391.5
Uruguay	162500	162500	52460	52460	9705.0	9705.0
Venezuela	911930	911930	160173	160173	11575.0	11575.0
Total	17326122	10145740	4380963	3947413	234881.8	182475.3

1/ Data for departments under programa (Cochabamba and Santa Cruz).

Does not include figures for Beni Pilot Plan.

2/ Does not include figures for: Amazonas, Pará, Maranhao, Piauí, Amapá and Rondonia.

3/ Does not include figures for: Caquetá, Chocó, Arauca, Putumayo, Amazonas, Guainia, Guaviare, Vichada and Islas San Andrés.

4/ Does not include figures for Guaviare and Vichada.

5/ Data estimated by the PAFMDC.

TABLE 19. Vaccination coverage of cattle against
foot-and-mouth disease.
South America, 1985.

Country	Bovine popu- lation under program. (x 1000)	Available vaccine doses. (x 1000)	Doses/ /Bov.
Argentina ¹	50031.0	179858.3 (169000.0) ²	3.38
Bolivia	400.0	316.2	0.79
Brazil	77098.4	185979.4	2.41
Colombia	16043.8	31236.3	1.95
Ecuador	3200.4	1146.9	0.36
Paraguay	7211.5	8755.3	1.21
Peru	3391.5	1449.9	0.43
Uruguay	9705.0	27341.2 (17076.8) ²	1.76
Venezuela	11575.0	9409.1	0.81

1/ In the february vaccination stage a monovalent of
"C" Argentina/84 was applied together with the
trivalent vaccine. Sheeps are also vaccinated in
Argentina.

2/ Doses injected in cattle.

TABLE 20. Production, control, international commercialization and availability of FMD vaccines. South America, 1985.

Country	Vaccine				Doses	
	Produced	Controlled	Approved	Exported	Imported	Available
Argentina	188898630	188898630	179858320	-	-	179858320
Bolivia	-	-	-	-	316205	-
Brazil ¹	213702045	213702045	185979360	-	-	185979360
Colombia ²	33016450	33016450	31359290	130000	7000	31236290
Chile	-	-	-	-	-	50000 ³
Ecuador	646900	646900	646900	-	500000 ⁴	1146900
Paraguay	7755310	7755310	7755310	-	1000000 ⁵	8755310
Peru ⁶	1848940	1848940	1448940	-	-	1448940
Uruguay	28335180 ⁷	27826180 ⁸	27826180	485000	-	27341180
Venezuela	8383150	8383150	8383150	-	1025900 ⁹	9409050
Total	482586605	482077605	443257450	615000	2849105	445225350

- 1/ Includes 8356570 doses of oil-adjuvanted vaccine approved from 20307145 doses produced and controlled.
- 2/ Includes 314160 dosis of oil-adjuvanted vaccine.
- 3/ Stock in PAFMDC for emergency outbreak.
- 4/ Includes 300000 oil-adjuvanted vaccine doses produced by PAFMDC.
- 5/ Oil-adjuvanted vaccine produced by PAFMDC.
- 6/ 400000 doses were still under control.
- 7/ 4327310 dosis will be controlled in 1986.
- 8/ Includes 4048200 doses produced in 1984.
- 9/ Includes 425900 oil-adjuvanted vaccines doses produced by PAFMDC.

TABLE 21. Human resources inventory . Foot and mouth disease prevention and control programs. South America, 1984-1985.

Countries	1984				1985			
	Total	Central	Laboratory	Field	Total	Central	Laboratory	Field
Argentina	1455	53	...	...	1606	50	169	1387
Bolivia	165	65	55	45	182	69	57	56
Brazil	9051	55	148	8848	...	...	...	...
Colombia	794	23	12	759	809	21	12	776
Chile	203	2	8	193	183	2	2	179
Ecuador	371	70	...	301	359	65	...	294
Paraguay	512	129	72	311	579	178	86	315
Peru	497	4	8	485	514	5	8	501
Uruguay	...	...	...	...	663	86	107	470
Venezuela	681	20	*	661	400	15	*	385
Total	13729	421	303	11603	5295	491	441	4363

... No information

*/ The laboratories personnel figures were included in the States Agricultural Development Central Offices Units, to which the Regional Diagnosis Laboratories are incorporated.

TABLE 22. Resources of foot-and-mouth disease prevention and control programs.
South America, 1985.

Country	Filds Operating Units	Human resources					
		Professionals			Others		
		Central	Laborat.	Field	Central	Laborat.	Field
Argentina	295	13	60	262	37	109	1125
Bolivia	19	18	30	20	51	30	33
Brazil	1100	...	...	...	...	...	...
Colombia	100	13	6	153	8	6	623
Chile	56	1	1	60	1	1	119
Ecuador	55	25	...	79	40	...	215
Paraguay	43	33	35	58	145	51	257
Peru	144	2	4	95	3	4	406
Uruguay	41	10	13	67	76	94	403
Venezuela	143	9	*	177	6	*	208
Total	1996	124	149	971	367	295	3389

... No information

*/ The laboratories personnel figures were included in the States Agricultural Development Central Offices Units, to which the Regional Diagnosis Laboratories are incorporated.

TABLE 23. Vehicles inventory. Foot-and-mouth disease prevention and control programs. South America, 1984-1985.

Countries	1984				1985			
	Total area Km ²	Total	Aut.	Moto.	Total area Km ²	Total	Aut.	Moto.
Argentina	...	...	...	...	2769237	1247	1247	-
Bolivia	276550	23	23	-	276550	23	23	-
Brazil	...	...	...	...	2235617	1138	973	165
Colombia	686743	329	156	173	686743	365	157	208
Chile	...	...	...	...	757820	9	9	-
Ecuador	...	61	61	-	...	48	48	-
Paraguay	...	...	...	...	406752	65	49	16
Peru	1282120	176	36	140	1282120	145	29	116
Uruguay	...	...	...	...	160737	113	102	11
Venezuela	911030	355	355	-	911930	325	325	-
Total	3156443	944	631	313	9487506	3478	2962	516

... No information

TABLE 24. Financial resources inventories (US\$). Operating expenses. Foot-and-mouth disease prevention and control programs. South America, 1984-1985.

Country	1984				1985			
	Total	Central	Laboratory	Field	Total	Central	Laboratory	Field
Argentina	13089693.00	...	...	...	19239843.00	...	...	...
Bolivia	3135.52	1252.38	968.44	914.70	193594.37	74735.07	34595.58	84263.72
Brazil	...	...	...	...	...	...	...	...
Colombia	6032400.80	1309950.40	158988.10	4563462.30	5813687.30	1006712.70	150007.30	4656967.30
Chile	430331.00	7016.00	19326.00	403989.00	493415.00	15068.00	21842.00	456505.00
Ecuador	1581952.40	275492.10	-	1306460.30	1157824.00	138487.00	-	1019337.00
Paraguay	1881056.00	653343.00	329351.00	898362.00	2203040.00	756761.00	376403.00	1069876.00
Peru	228533.30	...	...	...	208214.00	...	...	...
Uruguay	...	...	...	...	2373400.00	240900.00	417725.00	1714775.00
Venezuela	1432168.60	73802.30	*	1358366.30	...	...	...	...
Total	24679270.62	2320856.18	508633.54	8531554.60	31683017.67	2232663.77	1000572.88	9001724.02

*/ The laboratories operating expenses were included into the personnel firures of the States
Agricultures Development Central Offices Units, to which the Regional
diagnosis Laboratories are incorporated.
... No information.

TABLE 25. Financial resources inventory (Us\$). Capital expenses. Foot-and-mouth disease prevention and control programs. South America, 1984-1985.

Country	1984				1985			
	Total	Central	Laboratory	Field	Total	Central	Laboratory	Field
Argentina	362125.00	...	...	...	834368.00	...	...	...
Bolivia	75318.71	46381.92	12585.43	16351.36	36020.00	18373.00	-	17647.00
Brazil	...	...	...	...	...	...	...	...
Colombia	7479186.50	52132.90	14881.00	7412172.60	6962858.20	101818.20	19010.90	6842029.10
Chile	9121.00	-	64000.00	272.00	11800.00	-	9379.00	2421.00
Ecuador	95238.00	28571.00	-	66667.00	62176.20	18652.90	-	43523.30
Paraguay	326454.00	76758.00	89906.00	159790.00	581885.00	122512.00	219163.00	240210.00
Peru	-	-	-	-	-	-	-	-
Uruguay	56250.00	-	56250.00	-	-	-	-	-
Venezuela	357568.00	99420.50	*	258147.50	305647.80	107049.80	*	198598.00
Total	8761261.21	303264.32	237622.43	7913400.46	8794755.20	368405.90	247552.90	7344428.40

*/ The laboratories capital expenses were included into the personnel figures of the States
Agricultures Development Central Offices Units, to which the Regional
diagnosis Laboratories are incorporated.

... No information.

TABLE 26. Cattle and bovine semen imported.
South America, 1985.

Importing Country	Country of origin	Number	
		Bovines	Semen
Argentina	Paraguay	3	-
	Uruguay	233	x
	USA	44	x
	Canada	7	x
Brazil	F.R.Germany	-	x
	Bolivia	19000 ¹	-
	Canada	4	x
	Denmark	-	x
	USA	7	x
	France	7	x
	Italy	-	x
	United Kindom	-	x
	Switzerland	-	x
	Uruguay	303	-
Colombia ²	USA, Costa Rica, Ecuador, Canada	374	
Chile	USA	-	x
	England	-	x
	New Zealand	-	x
Ecuador	USA	1441	x
	Canada	49	x
	Costa Rica	1241	-
	New Zealand	200	-
	Panama	1600	-
	Cuba	100	-
Paraguay	USA	58	-
	Uruguay	978	-
	Argentina	725 ³	-
	Brazil	1914	-
	England	-	x
Peru	Argentina	240	-
	Chile	490	-
	Uruguay	1331	-
	Panama	50	-
	Spain	42	-
	New Zealand	1500	-
	USA	1975	x
	Canada	78	-

TABLE 26. (Continuation)

Importing Country	Country of origin	Number	
		Bovines	Semen
Uruguay	Argentina	19	-
	Brazil	38	-
Venezuela	Germany	-	x
	Canada	2432	x
	Cuba	126	x
	Colombia	520	-
	USA	3296	x
	England	-	x
	Mexico	36	-

1/ For slaughter.

2/ Number for country without specification.

3/ Includes 3 animals imported temporarily.

TABLE 27. Swines Importations.
South America, 1985.

Importing Country	Country of origin	Number of swines
Argentina	USA	9
Brazil	F.R.Germany	-
	France	-
Colombia	USA	423
Chile	USA	20
	Canada ¹	-
Peru	Netherland	21
	Canada	43
	Chile	7
	Germany	30
Uruguay	Argentina	1
Venezuela	USA	2437

1/ Semen

TABLE 28. Sheep Importations.
South America, 1985.

Importing Country	Country of origin	Number of Sheeps
Argentina	Australia	2
	New Zealand	2
Brazil	Australia	7
	Canada	1
	Chile	1
	USA	8
	France	28
	New Zealand	11
	Peru	3
	Uruguay	55
Chile	USA	2
Paraguay	Argentina	115
Peru	New Zealand	6
	Panama	100
Uruguay	Argentina	9
	Brazil	6
	Australia	10
	Chile	1
	New Zealand	4

TABLE 29. Goats Importations.
South America, 1985.

Importing Country	Country of origin	Number of Goats
Brazil	F.R. Germany	28
	Canada	4
	France	141
	Netherland	39
	Switzerland	81
Paraguay	Switzerland	36

TABLE 30. Horses Importations.
South America, 1985.

Importing Country	Country of origin	Number of Horses
Argentina	Uruguay	13
	Peru	6
	Brazil	11
	Germany	16
	Belgium	5
	USA	28
	France	9
	Irlanda	6
Brazil ¹	F.R.Germany	35
	Argentina	283
	Belgium	28
	Chile	91
	Spain	67
	USA	221
	France	18
	Netherland	7
	Paraguay	8
	Peru	3
	Poland	2
	Portugal	98
	Switzerland	4
	Uruguay	2
		978
Colombia ²	USA, Argentina, France	
	Spain, Ecuador	85
Chile	Brazil	12
	Peru	1
	France	35
	Argentina	95
	Spain	1
	Denmark	3
	USA	14
	Uruguay	1

TABLE 30. (Continuation)

Importing Country	Country of origin	Number of Horses
Peru	Argentina	66
	Brazil	11
	Chile	17
	Colombia	19
	Ecuador	13
	Venezuela	10
	USA	52
	England	3
Paraguay ³	USA	25
	Argentina	15
	Germany	23
	Uruguay	1120
	Brazil	5
Uruguay	Argentina	3
	USA	8
Venezuela	Germany	2
	Bolivia	4
	Colombia	1
	USA	185
	France	3
	England	8
	Jamaica	1
	Mexico	1
	Puerto Rico	3
	Panama	2
	Rep. Dominicana	1

1/ Were included: 240 competition animales temporarily imported from: F.R.Germany (6), Argentina (70), Belgium (78), Chile (43), USA (6), France (12). Paraguay (5), England (1) y Uruguay (69). Also imported 793 animals from Uruguay for slaughters.

2/ No quantities specified for each country.

3/ 5 animals temporarily imported from Brazil are included.

TABLE 31. Cattle and bovine semen exports.
South America, 1985.

Exporting Country	Importing Country	Number	
		Bovines	Semen(doses)
Argentina	Bolivia	4	-
	Paraguay	15	-
	Uruguay	20	-
Brazil	Argentina	2	-
	Bolivia	189	-
	Paraguay	123	-
	Uruguay	56	-
Colombia	Curazao,		
	Venezuela	1517	-
Chile	Peru	121	-
	Colombia	117	-
Paraguay ¹	Brazil	34	-
	Uruguay	14	-
Uruguay	Argentina	376	x
	Brazil	108	-
	Bolivia	1249	-
	Paraguay	1034	-
	Peru	159	-

1/ 3 animals exported temporarily included.

TABLE 32. Swines Exports.
South America, 1985.

Exporting Country	Importing Country	Number of Swines
Argentina	Bolivia	16
	Uruguay	2
Chile	Peru	7
Peru	Bolivia	5
Venezuela	Colombia	1350

TABLE 33. Sheeps Exports.
South America, 1985.

Exporting Country	Importing Country	Number of Sheeps
Argentina	Ecuador	3152
	Brazil	3
	Uruguay	9
Brazil	Uruguay	26
Chile	Uruguay	2
Peru	Brazil	4
Uruguay	Argentina	2
	Brazil	38
	Peru	215
Venezuela	Aruba	88

TABLE 34. Horses Exports.
South America, 1985.

Exporting Country	Importing Country	Number of Horses
Argentina	Bolivia	192
	Brazil	151
	Colombia	17
	Chile	218
	Paraguay	14
	Peru	20
	Uruguay	44
	Venezuela	57
	Panama	73
	Puerto Rico	10
	Guatemala	4
	Mexico	13
	Germany	57
	Spain	49
	USA	499
	France	86
	England	45
	Italy	51
	Japan	12
	Thailand	1
Brazil ¹	Nigeria	27
	South Africa	44
	F.R.Germany	18
	Argentina	25
	Belgium	38
	Chile	10
	Spain	43
	USA	18
	France	46
	Guyana (French)	1
	Paraguay	25
	United Kindom	9
	Uruguay	66
Colombia ²	Spain, Puerto Rico, Panama, Ecuador, Peru	148
Chile	Brazil	51
	Argentina	10
	Curazao	20
	USA	64
	Peru	8

TABLE 34. (Continuation).

Exporting Country	Importing Country	Number of Horses
Chile	Ecuador	1
	Uruguay	26
	Spain	24
	Panama	6
	England	16
	Bolivia	6
	Venezuela	10
Paraguay ³	Brazil	15
	Uruguay	9
	Argentina	2
Peru	Argentina	16
	Colombia	15
	Bolivia	2
	Venezuela	5
	Ecuador	132
	Guatemala	1
	Panama	20
	Honduras	16
	USA	60
	Austria	1
Uruguay	Argentina	2191
	Brazil	456
	USA	8
	Spain	57
	Chile	9
	Italy	2085
	Paraguay	542
Venezuela	Curacao	1
	USA	4
	Peru	5

- 1/ Were included: 228 competition animals temporarily exported to: F.R.Germany (18), Argentina (18), Belgium (38), Chile (43), USA (37), France (1), Paraguay (9), United Kindom (25), Uruguay (38).
- 2/ Not quantities for country specificated.
- 3/ Were included: 17 animals temporarily exported to Brazil (12), Uruguay (3) y Argentina (2).

TABLE 35. Continental Information and Epidemiological Surveillance System for Vesicular Diseases in Cattle. Reception level and delays of transmission of weekly reports of outbreaks by grid squares of the map. South America, 1985.

Country	Weekly reports			Days Delays							
	Received		Published ¹	Until receipt. ²				Receipt Publication			
	Nr.	%	Nr.	%	Md	Mx	Mn ³	Md	Mx	Mn	Total
Argentina	53	100	53	100	17	55	4	3	36	-	21 91 7
Bolivia	53	100	53	100	21	53	-	3	11	1	28 56 6
Brazil	53	100	53	100	8	14	7	4	10	-	14 21 7
Colombia	53	100	53	100	7	14	5	2	10	-	10 14 6
Ecuador	52	98	52	98	7	20	5	1	10	-	7 21 7
Paraguay	53	100	53	100	4	7	3	3	6	-	7 10 6
Peru	53	100	53	100	14	108	5	2	11	-	14 108 7
Uruguay	53	100	53	100	7	19	-	2	9	-	7 21 6
Venezuela	53	100	53	100	11	26	6	3	8	-	14 28 13

1/ Number of weekly report published in proportion to those received.

2/ Time elapsed between the last day of the week covered by the report and receipt thereof by the PAFMDC.

3/ Md = Median; Mx = Maximum; Mn = Minimum. Figures represent the number of days.

TABLE 36. Continental Information and Epidemiological Surveillance System for Vesicular Diseases in Cattle. Reception level and delays of transmission of monthly reports of affected herds and diagnosis by political division. South America, 1985.

Country	Nr. Received	Nr. Published	Months not received
Argentina	11	11	1
Bolivia	12	12	-
Brazil	12	12	-
Colombia	12	12	-
Ecuador	11	11	1
Paraguay	12	12	-
Peru	11	11	1
Uruguay	11	11	1
Venezuela	12	12	-

TABLE 37. Continental Information and Epidemiological Surveillance System for Vesicular Diseases in Cattle. Number of days delay in receipt of monthly reports. South America, 1985.

Country	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nvr	Dec	Median
Argentina	33	5	135	105	74	156	125	94	64	35	55	NR	74.00
Bolivia	26	55	24	49	18	204	173	142	112	81	51	20	66.00
Brazil	32	32	30	30	25	31	28	31	37	43	51	35	33.50
Colombia	29	64	39	36	31	29	34	35	35	39	38	28	35.00
Ecuador	194	166	135	43	27	44	50	19	36	25	38	NR	43.00
Paraguay	67	47	16	23	31	24	26	27	28	26	37	29	27.00
Peru	68	69	38	49	56	71	40	89	59	83	53	NR	68.50
Uruguay	21	39	38	162	45	33	141	58	80	49	19	NR	47.00
Venezuela	82	54	23	27	28	113	82	51	30	91	61	30	52.50
Median	33	54	38	43	31	44	50	51	37	43	51	29	

TABLE 38. Epidemiological surveillance activities: Indicators of laboratory confirmation of herds affected by Vesicular Diseases. South America, 1985.

Countries	Affected herds			Percentage	
	Total	Sampled	Positive. Diagnosis	Sampled	Positive. Diagnosis
Argentina	1289	674	303	45	24
Bolivia	48	13	9	27	19
Brazil	1524	579	288	38	19
Colombia	2072	1208	856	58	41
Ecuador	65	39	29	60	45
Paraguay	19	13	8	68	42
Peru	105	45	42	43	40
Uruguay	21	21	18	100	86
Venezuela	208	137	70	66	34
Total	5351	2729	1623	51	30

FIGURE 1. DISTRIBUTION OF GRID SQUARES ACCORDING TO THE NUMBER OF WEEKS WITH VESICULAR DISEASE OCCURRENCE. SOUTH AMERICA, 1985

