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

SOUTH AMERICA, 1988

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REPORT OF THE COUNTRIES TO THE SOUTH AMERICAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE (COSALFA) XVI

INTRODUCTION

As usual, this Report comprises three chapters, which are:

1. Situation of the vesicular diseases
2. Situation of the foot-and-mouth disease control programs
3. Continental Surveillance and Information System for Vesicular Diseases: Results and Performance

This year several modifications were introduced in the Form of the Guide for Preparation of the Report for COSALFA. The purpose was to improve the content of the information provided by the countries, however, the goal was not achieved. Although the epidemiological information remains acceptable, the other information continues to show important omissions and deficiencies that can jeopardize the ongoing, permanent updating of the knowledge required to orient the technical and administrative decisions necessary for the adequate development of the foot-and-mouth disease control programs.

The development of the vesicular diseases continental surveillance and information system is one of the major results that the foot-and-mouth disease programs have achieved in forming suitable infrastructure. The annual information routed to each COSALFA meeting is a vital flow in the system that cannot be allowed to deteriorate. This flow feed the process of final analysis of each and all the foot-and-mouth disease programs in South America, an analysis that is jointly made by the animal-health executives at each COSALFA meeting. The result is a strengthening of the programs' coordination and orientation for technical cooperation.

Given the undeniable importance of this all-encompassing instrument, we must be systematic in the process of gathering and providing this information in order to avoid that it becomes a routine shoddily performed, thereby hampering its very purpose.

The Secretary

SITUATION OF THE FOOT-AND-MOUTH DISEASE CONTROL PROGRAMS SOUTH AMERICA, 1988

1. SITUATION OF VESICULAR DISEASES

1.1. General situation

Vesicular diseases in South America in 1988 affected 3668 properties, a 7% decline in relation to 1987. This is the lowest figure recorded in the last ten years. The rate of cattle herds affected was 1 per 1000, a rate comparable to that recorded in recent years.

Samples for laboratory diagnosis were collected in 1911 episodes (52.3%), of which foot-and-mouth disease (FMD) was diagnosed in 825. These produced type O in 468 cases (57%), type A in 323 (39%), and type C in 34 cases (4%). Vesicular stomatitis was diagnosed in 476 episodes, of which 287 (60.0%) were New Jersey type and 189 (40.0%) Indiana type.

Bovine morbidity was 4.5 °/ooo, lethality reached 1.5% and internal morbidity reached 12%. In comparison with the 1987 figures (8 °/ooo, 0.5% and 10%), there was a decline in the first rate and an upswing in the last two.

Swine morbidity was 2 °/ooo, lethality 15% and internal morbidity 21%. Compared to the preceding year, morbidity was stable while lethality dropped 50% and internal morbidity doubled.

The populational morbidity for the other economically important species was inexpressive.

Regarding the overall presence of the vesicular diseases on the continent, the following were some of the important situations recorded:

- total absence of FMD cases in Chile;

- epidemic outbreak of FMD along Colombia's border with Ecuador, caused by virus type A. It affected several municipalities in the departament of Nariño in Colombia and Cantones in the province of Carchi in Ecuador. Also in Colombia there was a significant increase in the number of episodes caused by type O virus, especially in the departament of Norte de Santander and the Boyacá and Cundinamarca highlands.

- FMD outbreaks continued to appear in west-central Brazil, presenting risks for the Amazon area of South America as well as for other regions of Brazil. There was a high frequency of episodes in the northeast, and ocurrence of FMD in the Territory of Roraima near Guyana (which is free of the disease);

- an extensive outbreak of vesicular stomatitis in Venezuela. The ocurrence of this disease continues to increase in South America. Likewise, the record of episodes with diagnosis rose 70% in relation to 1987;

- Chile, Guyana, French Guiana, Suriname, the Argentine Patagonia and the Chocó region in Colombia, continue free of FMD;

- Central America, the Caribbean and North America recorded no ocurrence of FMD. Vesicular stomatitis in Central America and Mexico (478 episodes) declined by 8% in comparison with 1987 (509 episodes). The virus type was identified in 47.4% of the clinically affected herds. The New Jersey virus was predominant in 86% of the foci diagnosed.

1.2 Country-by-country situation

ARGENTINA

The Argentine authorities reported 365 herds affected in 1988. That was 27% of the total recorded in 1987 (1346). In practically all the cases cattle were affected (362).

This total of occurrences is the lowest since 1982. Likewise, 1988 saw a decline in the number of grid squares affected --138 of the 1216 existing squares (11%), as compared to the 23% recorded in 1987. The average of herds affected per gridsquare was 2.66.

The provinces with the highest incidence (86% of the episodes recorded) were again Buenos Aires, La Pampa and Córdoba. May to October is the 'high ocurrence' season.

Virus type O accounted for 70% of the total 135 positive diagnoses. The frequency of virus type A (35 diagnoses) declined by 92.8% in comparison with 1987's total of 486 diagnoses. Virus C diagnoses likewise dropped by some 81.5% (5 diagnoses in 1988 and 27 in 1987). The subtypes diagnosed were O_1, A-81 and C_3. Geographically, virus O was most frequent in the provinces of Buenos Aires and La Pampa (81%), with most diagnoses recorded between June and October.

Bovine morbidity reached 6 °/ooo, while lethality and internal morbidity totalled 1.6% and 9.4% respectively. These figures differ from the previous year which posted 18 °/ooo

for general morbidity, 0.14% for lethality and 11% for internal morbidity. 1988 saw a drop (4.2 °/oo in 1987 to 1.2 °/oo in 1988) in the total of herds with cattle affected by FMD.

BOLIVIA

The official animal-health authorities reported 65 episodes of vesicular diseases in 1988, in 21 of the total 421 geographic grid squares into which the country is divided. That figure was practically half of the episodes reported in 1987. Samples for laboratory analysis were collected in only 26 episodes (40.6%). FMD virus was identified in 17 samples --13 episodes with virus A and 4 with virus C. A_{24} and C_3 were the active subtypes.

Fifty-nine and 65 episodes reported in Bolivia occurred in the area under the SENARB program (Santa Cruz and Cochabamba). That meant an increase of 40% in that area in relation to the preceding year. Of the total of 13 diagnoses of FMD confirmed in those two departaments, 10 yielded virus A and 3 virus C. The affected-herd rate in that area reached 6.4%, almost double the 1987 total. Only 6 episodes were recorded in 1988 "in the rest of the country". There were 42 episodes in 1987.

In Santa Cruz and Cochabamba, the cattle morbidity rate, and lethality and internal morbidity in the affected herds in 1988 yielded 6.3 °/oo, 4.5% and 4.5%, respectively.

BRAZIL

Vesicular disease records in 1988 indicate a total of 1255 herds affected, higher than the 1064 herds reported in 1987. The average of herds affected per grid square was 7.7, appearing in 163 of the 778 squares encompassing the country (21%). Of the samples taken for laboratory analysis, 356 tested positive: 92 were FMD virus type O, 91 were type A, 19 type C, 4 Indiana type vesicular stomatitis, and 150 were negative. The four foci of vesicular stomatitis occurred in the state of Ceará.

The fundamental differences in relation to the preceding year were the decline in the diagnoses of virus A, and the detection of vesicular stomatitis again in 1988, whereas the diagnoses of viruses O and C remained virtually stable. The northeast had the largest proportion of vesicular disease occurrences (734 foci), accounting for 58% of the country's total. In the northeast, the states with the highest disease frequencies were Pernambuco, Sergipe and Bahia. Only 75 episodes were recorded in the south region (Rio Grande do Sul, Santa Catarina and Paraná). In the southeastern region (154 episodes) and central-west (204), the four states with the highest frequencies are Goiás (88 foci), Mato Grosso do Sul (66), Sao

Paulo (69) and Rio de Janeiro (43). The 67 episodes reported in the state of Rondonia are of major importance, as the disease in that northern area is epidemiologically very dangerous for Brazil's Amazon cattle industry and for the bordering country (Bolivia). Acre has reported a low incidence of FMD occurrence, although in that area the Federal Territory of Roraima reported an episode in which virus type O was diagnosed. This is also a risk situation for neighboring countries, due to its proximity with Guyana, a country free of the disease. No episodes of FMD were reported during the year in Amapá, Amazonas, the Federal District or Espírito Santo.

Owing mainly to the figures posted in the northeast, March through September is the period when monthly frequencies are highest across the country.

The FMD subtypes identified during the period were O_1, A_{24}, A-81, A84-Sao Carlos and C_3.

The following were the major rates for the bovine population: populational morbidity of 3.1 per thousand; lethality of 1.2% and internal morbidity of 14.3%. Cattle was the species most affected.

CHILE

On April 28, 1988, Chile was again declared a country free of FMD, after eradicating the outbreak that occurred in 1987. The Chilean Animal-Health Service has adopted stringent measures in the summer pastures high up in the Andes, to reduce the risk of reintroducing the virus into the country. The Service has set up a buffer zone in the high-risk areas.

COLOMBIA

The number of vesicular disease episodes reported in 1988 rose to 1577, significantly higher (84.2%) than the total in 1987. That was due mainly to the increase of episodies in the departament of Santander and on the highland plateau of Boyacá and Cundinamarca, occasioned by FMD virus type O, and in Nariño, caused by FMD virus type A. Small farms are predominant in this latter area.

Vesicular diseases were plotted in 130 grid squares, up from the 113 squares affected in 1987. Thus 29% of the total of squares covering the country were affected. April showed the lowest number of episodes reported (37), while July and August posted the highest totals (207 and 206, respectively).

Diseased cattle were included in 96% of the episodes in which the affected animal species were identified.

Specimens for laboratory analysis were collected in 1104 of the 1577 episodes reported (70%); results were negative in 249 cases and the causal agent was identified in 855 episodes.

Of the 855 positive diagnoses, slightly more than half (434) involved vesicular stomatitis; the rest was FMD. The number of diagnoses in 1988 was higher than in 1987 for the four types of viruses identified. Diagnosis of virus type A rose by 170% (from 90 to 153), followed by virus type O (168%, from 100 to 268). With reference to vesicular stomatitis, 250 diagnoses of New Jersey type were made, and 184 of Indiana type; the number of diagnoses increased 76% and 60% respectively, in comparison with 1987. The FMD subtypes identified during the year were A_{24}, A-85 and O_1.

The rate of herds with cattle affected by vesicular disease (3.3%) was almost twice that recorded in 1987 (1.7%). Populational morbidity, lethality and internal morbidity in the cattle populational reached 10.4°/oo, 1.2% and 14.3%, respectively.

ECUADOR

The recorded frequency of vesicular diseases episodes in 1988 rose to 97, almost three times higher than the 34 episodes reported in 1987. Samples were collected in 42 (43%) foci, yielding identification of virus A in 15 foci, virus O in two, New Jersey vesicular stomatitis virus in three and Indiana type in one. The 21 remaining samples diagnosed negative.

As for the spatial distribution of the episodes reported, they affected 32 of the 188 grid squares encompassing the country. Only 17 grid squares were affected by episodes in 1987. The increase was therefore 88.3%, and the provinces with the highest number of episodes were Pichincha (19), Pastaza (15) and Carchi (12). Seasonally, September and October were the months posting highest records (18 and 19, respectively). The identified FMD subtypes were A_{24} and O_1.

The rate of cattle herds clinically affected by vesicular disease was less than 1 °/oo. Cattle morbidity reached 6 °/oo, triple the previous year's total. Lethality in cattle was 1.3% and internal morbidity was 18.9%. There was no report of death from vesicular disease in the preceding year, and internal morbidity was practically the same (16.5%) as in 1988.

GUYANA

There was no report of vesicular disease in 1988.

FRENCH GUIANA

There was no report of vesicular disease in 1988.

PARAGUAY

Vesicular disease was reported in 1988 in only three of the 179 gridsquare into which the country is divided. Material for laboratory analysis was collected in all 3 cases, yielding negative diagnosis in one case and identifying virus type O, subtype O_1 in two analyses. The occurrence of vesicular diseases has been the lowest recorded in recent years. Cases totalled 23, with no deaths, and internal morbidity reached 31.1%. Only cattle were affected. Two of the episodes were reported during the first quarter in San Pedro and Misiones, and one was reported in the second quarter in Boquerón.

PERU

The number of vesicular disease episodes recorded in 1988 (68) is more than twice the 1987 total of 28, although the number of grid square affected was practically the same. The FMD virus type was identified in only 7 episodes (8.5%). Six were caused by type A virus, one by type O. With respect to vesicular stomatitis, 7 episodes yielded identification of New Jersey virus, of which 6 were located in the departament of Cajamarca in January and one in Lima in August. There was no record of Indiana type virus. The FMD virus subtypes diagnosed in 1988 were O_1 and A_{24}.

The affected-herd rate was lower than 1 °/oo. The rates for morbidity, lethality and internal morbidity were 1.8 °/oo, 2.7% and 6.9%, respectively.

Geographically, FMD was reported in the departaments of Piura, Puno and Lima. Of epidemiological importance is the presence of FMD in Piura and Puno, respectively bordering on Ecuador and Bolivia. The situation in Piura has recurred in recent years.

SURINAME

No information is available on the presence of vesicular diseases in 1988. Suriname does not participate in the continental surveillance system.

URUGUAY

Only 10 episodes of vesicular disease were reported in 1988, all of them in the last quarter of the year and distributed in 7 departaments. This is the third lowest record of vesicular disease occurrence in the last 17 years, and affected herds in only 9 of the 489 grid squares into which Uruguay is divided (1.8%). FMD virus presence was diagnosed in 8 of the 10 episodes (type O in two, type C in 6). The two remaining episodes tested negative. The identified subtypes were O_1 and C_3; cattle and sheep were the affected species.

The rate of herds with affected cattle was 0.12 °/oo, bovine morbidity was 0.1 °/ooo, lethality 1% and internal morbidity 1.4%. Except for lethality, these rates are lower than in 1987, when no deaths were reported.

Geographically the disease was present in Rivera, in departamentos along the coast, and in the southern region of the country.

VENEZUELA

A total of 228 vesicular disease episodes was reported in 1988, the highest figure reported by that country in the last ten years. The increase was probably due to an outbreak of New Jersey vesicular stomatitis that affected eastern Venezuela, mostly the state of Monagas. New Jersey virus was last diagnosed in that state in October 1980. The episodes of vesicular disease were present in 55 of the 352 grid squares that cover the country (15.6%), a figure slightly lower than in 1987 when 60 squares were affected. On the national level lab samples were taken in 91 foci, yielding the following results: FMD, virus O, 6 foci; virus type A, 10 foci; New Jersey vesicular stomatitis virus, 27 foci. There were 38 negative results and diagnosis was not possible in 10 specimens. No case of Indiana type vesicular stomatitis was diagnosed during the year. The active FMD virus subtypes were A_{24}, A_{32} and O_1.

The rate of herds with cattle affected by vesicular disease reached 1.6 °/o, cattle morbidity was 5.2 °/ooo, internal morbidity was 11.3% and lethality 1.0%. The first --rate of herds with affected cattle-- almost tripled; the second --bovine morbidity-- quadrupled, and the others were similar to the preceding year.

2. SITUATION OF FOOT-AND-MOUTH DISEASE CONTROL PROGRAMS IN SOUTH AMERICA, 1988

2.1 General situation

Complying with the recommendation of the Fifth Inter-American Meeting at the Ministerial Level on Animal Health, the I Meeting of the Hemispheric Committee for the Eradication of Foot-and-Mouth Disease (COHEFA) was held on July 6-7, 1988, at the PAHO/WHO headquarters in Washington, D.C., USA. The Committee is entrusted with "obtaining the funds, ensuring the implementation of the political desire to eradicate the disease, and conducting the evaluation of the progress of the continental eradication program."

The board of directors were elected as follows: Dr. Iris Rezende, Brazilian Minister of Agriculture, representing the

governments of the Amazon subregion, as President; Mr. John R. Dahl, of the National Association of United States Cattlemen, representing the producers of the North American subregion, as Vice-President; and as relator, Dr. Patrick McKenzie, Minister of Agriculture of Guyana, representing the governments of the Caribbean subregion. Dr. Carlyle Guerra de Macedo, Director of the Pan American Health Organization (PAHO) acted as Secretary ex-officio.

Representatives from the following countries participated as members of the Committee: Argentina, Brazil, Canada, Colombia, Costa Rica and Guyana. Guests were also present from Bolivia, Chile, USA and Uruguay.

The following associations of livestock producers also participated in the Committee: Brazilian Association of Zebu Raisers; National Cattlemen's Association of the USA; Andean Confederation of Cattlemen; Inter-American Livestock Producers Confederation and Rural Federation of Uruguay.

Observers were also on hand from: IDB, World Bank; EEC; COSALFA; Rural Federation of the State of Rio Grande do Sul (FARSUL), Brazil; National Agriculture Confederation (CNA), Brazil; Brazilian Association of Meat Importers and Exporters; Colombian Agrolivestock Institute (ICA); USAID; IICA; OIE; OAS; FAO and UNDP.

The tasks assigned to this Committee, as well as the nature of the recommendation it has made, will undoubtedly have significant influence on the future march of the national FMD control programs, and will be therefore of extreme importance for COSALFA.

During 1988 several other events took place. Due to their characteristics, they will also probably exert influence beyond the geographic limits of the area and/or of the countries included.

One of them is the acceptable, at the highest national political levels, of the decision taken by Argentina, Brazil and Uruguay, to achieve the "Eradication of Foot-and-Mouth Disease in the Southeast of the Plata River Basin" in the shortest possible time.

Likewise, during the year the first disbursements were made from the credits allocated by the World Bank to Brazil and by the Inter-American Development Bank, to Uruguay. The funds were to complement the funding of their respective Animal Disease Control Programs, including FMD. The two countries paid on the financial commitments related to the Technical Cooperation Agreement with the Pan American Foot-and-Mouth Disease Control Center/PAHO for the Project in the Southeast of the Plata River Basin.

Also of importance were the diplomatic steps taken by some countries of the region to request support from the European Economic Communities Delegation for Latin America, headquartered in Venezuela. The objective was to earn that European group's cooperation in carrying out the Program to Eradicate Foot-and- Mouth Disease in South America. The PAHO, JUNAC and IICA, among others, have also developed action and/or given their support to this Program.

On the other hand, although the programs' development and operationability continue to be affected by the administrative and financial limitations present in most of the region's nations, they are still carrying on activities related to: epidemiological surveillance; vaccinations; control of livestock movement and importation of animals, products and by-products of animal origin; production and control of vaccines; training of personnel; border agreements and international coordination.

The programs' coverage maintained levels very similar to the preceding years with respect to the countries' areas under program. Although of slight significance there were increases in the coverage of cattle herds and the number of cattle covered, as the first rose from 73.6% in 1987 to 79.6% in 1988 and the second went from 77.4% to 81.2%.

On the regional level, the total production of FMD vaccine (498.4 million doses) was 4% lower than in 1987. 49.8 million doses were oil adjuvant including 244,000 whose use was authorized only for pigs. The total of available doses (vaccine approved plus the remainder from the preceding year) reached 431.5 million, almost 5% lower than the 1987 total. 47.4 million doses of oil-adjuvant vaccine were available.

When compared with the preceding year, the infrastructure for carrying out the programs underwent slight changes in 1988. Consequently, the number of field units rose from 1871 to 1895. Human resources totalled 12,925 staff members, of which 3154 were professional staff and 9771 were technical and administrative personnel. The motor vehicle pool amounted to 3926 different vehicles.

Argentina, Peru and Uruguay provided no information about the public and/or private funding to cover operation and capital expenditures.

Taking into account the omissions mentioned herein, as well as various inconsistencies in the data from other countries, no description will be made of the financial aspects related to the region's FMD control programs. Table 31 includes only the information supplied by some of the countries.

2.2 Country-by-country situation.

ARGENTINA

The National Animal Health Service (SENASA) covers the country' entire continental territory and the country's livestock.

A differential criteria for vaccination continued to be applied in 1988, distinguishing between four areas, as follows:

a) Systematic vaccination

North of the Barrancas and Colorado Rivers, vaccination is mandatory, systematic and periodical. Here cattle are vaccinated with saponin-hydroxide vaccine every four months and sheep twice a year.

The cattle raisers themselves or private veterinarians perform the vaccinations; SENASA conducts the control of vaccination on randomly selected farms each day of the vaccination period.

This region includes the areas under the Special Oil-Adjuvant Vaccine Programs. They include the 'partidos' of Ayacucho, Navarro and Villarino in the province of Buenos Aires, the departaments of Caleu Caleu, Lihual Calel, Curaco and Puelen in the province of La Pampa and the departament of Federación in Entre Ríos province.

b) Transitory mandatory vaccination

This area lies south of the Barrancas and Colorado Rivers and encompasses six departaments of Río Negro province and the 'partido' of Patagones in Buenos Aires province.

Here official agents conduct the vaccination, utilizing oil-adjuvanted vaccine applied only once a year.

c) Ring vaccination

Comprises the province of Neuquén and south of the Negro River. Vaccination is performed in this region only when foci appear, and vaccination is done in a ring pattern by official agents.

d) Free area

Includes the part of Argentina located south of the 42° parallel, and encompasses the provinces of Chubut, Santa Cruz and the Argentine part of Tierra del Fuego. FMD vaccination is prohibited in this area where stamping-out is used whenever the disease appears, which did not happen in 1988.

The country submitted the National Plan for FMD Control and Eradication. Priority is on the primary endemic regions, according to the experience of the Special Oil-Adjuvant Vaccination Programs conducted in previously mentioned regions, whose administrative and sanitary procedures will be applied to other primary endemic areas in the country. The plan will be shortly submitted to international funding agencies and was announced on January 31st by the President of Argentina. The priority given to the primary endemic areas, which include approximately 28.5 million head of cattle, will be developed through the use of oil-adjuvant vaccine administered by official agencies with direct funding by the cattlemen.

125.2 million doses of vaccine were produced in 1988. Of the 117 million doses approved, 109.5 million were the saponin-hydroxide type and 7.5 million oil-adjuvant type. The average cost was US$0.90 for the oil-adjuvant vaccine and US$0.70 for the saponin-hydroxide vaccine.

Available personnel totalled 1638 persons in 1988, of which 383 were veterinarians, 953 technical assistants and 302 administrative personnel. These figures include the 147 laboratory personnel comprising 57 veterinarians and 90 assistants. The latter are 57 paratechnical and 33 administrative staff.

The program operated 333 field units (field offices) and 1267 vehicles in 1988. The country's area is 2,779,892 Km^2. Each field unit covers in average 8348 Km^2, 889 herds and 140,790 head of cattle. In the field, the program personnel included 1 veterinarian, 4 assistants and 4 vehicles per unit. Two SELAB and 2 SELSA personnel underwent training in 1988.

The report sent to the Center did not include information on the amount of public and private expenditures made during the year.

With regard to international trade, Argentina imported equines, cattle and sheep from Uruguay; equines and cattle from Brazil, Chile, USA and Paraguay; equines and sheep from Peru; equines from Belgium and France; cattle from Canada and sheep from Australia and New Zealand. It also imported semen from Canada, the USA, New Zealand and Uruguay, and embryos from Germany and the USA.

On the other side of the trade ledger, Argentina exported equines, cattle and pigs to Uruguay; equines, cattle and sheep to Brazil; equines, sheep and pigs to Bolivia; equines to Chile and equines and cattle to Peru; equines to Germany, the USA, Italy, England and Mexico; semen to Uruguay and meat to Brazil, the EEC, Chile, Canary Islands, Israel, Hong Kong, Malta and Switzerland.

Argentina maintains international cooperation agreements with its neighbors: Bolivia, Brazil, Chile, Paraguay and Uruguay, as well as with Brazil, Uruguay and the PAHO through the PAFMDC, for the Subregional Project for FMD Control and Eradication in the Plata Basin.

BOLIVIA

The country has an area of 1,098,581 Km^2. In 1986, figures provided by the Ministry of Agriculture and Peasant Affairs (MACA) indicated the existence of 98,139 properties with cattle and an animal population (in millions) of 5.82 cattle, 9.41 sheep, 1.11 pigs, 1.23 goats, 1.43 camelidae and 0.90 equines.

There is no FMD program that covers the entire country. The National FMD, Rabies and Brucelosis Control Service (SENARB), with jurisdiction in the departaments of Cochabamba and Santa Cruz, only partially covers those areas. Under program it totals 250,650 Km^2, 8900 herds of cattle and 530,000 head of cattle, approximately. A relatively systematic activity is also developed in part of the departament of Beni and in six provinces of the departament of La Paz, bordering Peru. Personnel from SENARB and/or the Livestock Bureau meet sanitary emergencies caused by vesicular diseases when they occur outside the territories mentioned above.

SENARB operates 15 local field units (5 in Cochabamba and 10 in Santa Cruz), in addition to a Central Office and three diagnostic laboratories. There is a health post in the town of Trinidad, departament of Beni. The total personnel are 143 employees (52 veterinarians, 49 technical staff and 42 administrative assistants). The operating units are manned by 27 veterinarians, 37 technical staff and 8 administrative assistants; the rest are assigned to the Central Office and to the diagnostic laboratories (26 and 45 persons, respectively).

Available funds amounted to US$276,920 of which US$228,920 came from the public sector and US$48,000 from the private sector from vaccine sales.

Considering only the public funds --which were used solely to cover operating costs-- and only the area under program, we get an average figure of US$25.70 per herd and US$0.43 per head of cattle for the FMD program in 1988. These values are almost one third of those available in 1987.

The vaccination activity is stimulated and supervised by SENARB in the area under program. But there is no quick procedure for knowing precisely how much vaccine is administered in Bolivia. FMD vaccine may be imported freely and comes mainly from Brazil. In 1988 the PAFMDC sent 180,000 doses of oil-adjuvant vaccine to SENARB and 20,000 doses to MACA as a

donation to be used in the area bordering Peru. Santa Cruz is the area wherein SENARB registers the largest number of vaccinated cattle (164,701 of the total of 209,366 doses applied), there is no record of vaccines administered to other animal species.

The MACA Livestock General Office records the importing of 4146 cattle from countries of South America and 1000 ampoules of pig semen from the USA.

There was practically no training of SENARB personnel in 1988. Likewise, community participation and activities in health education dropped significantly.

During 1988 the MACA approached the IDB seeking a loan for a Livestock Development and Meat Exportation Project in the regions of Santa Cruz de la Sierra and el Beni. An important component of the project is the preparation and implementation of an animal health program including FMD. It is estimated that the project could be terminated in the second half of 1989.

Regarding coordination with other agencies, the SENARB works with the MACA, Ministry of Health and numerous livestock and cattle federations, cooperatives and associations, as well as with representatives and offices of international bodies and technical cooperation agencies like FAO, IDB, PAHO/WHO, IICA, JICA and CIAT. Bolivia maintains permanent relations with similar programs in Argentina, Brazil, Chile, Paraguay and Peru, as well as with the PAFMDC and the Zoonosis Center of the PAHO/WHO.

BRAZIL

The FMD control program covers 37.0% of Brazil's total area, 66.0% of its herds and 69.0% of its cattle population.

The FMD vaccine prepared and controlled in 1988 amounted to 281.8 million doses, of which 35.1 million (12%) were oil-adjuvant vaccine. The remaining portion was saponin-hydroxide vaccine (87.8%). 30.7 million doses (87.4%) of oil-adjuvant vaccines and 198.8 million doses (80.6%) of the saponin-hydroxide vaccines were approved. The method of control used is the protection against generalization of footpad lesions. These results are better than those posted in 1987.

366,206 herds were inspected and 51.8 million cattle vaccinated in the last vaccination period. 2.5 doses of vaccine was available per head in the area under program, a 27% increase over the 1987 figure.

957 field units were operated during the year, a number similar to 1987. That means that each field unit services an average area of 3254 Km^2, 1379 herds and 93,621 head of cattle. 11 laboratory units support the program.

The Program engaged 7738 personnel of which field staff include 1808 veterinarians, 4089 technical assistants and 1540 administrative assistants. The laboratory services employ 58 professional staff, 56 technical assistants and 187 administrative personnel. 1393 vehicles comprise the motor pool.

Regarding funding, the federal government allocated US$6.6 million dollars, of which 4.41 million covered capital outlays and the rest operating costs.

A total of 399 professional staff from the Secretariat of Animal Defense received training in the areas of control of animal diseases, prevention of exotic diseases, control of biologicals, laboratory administration and sanitary education.

Disbursements were initiated from the loan secured from the IBRD (International Bank for Reconstruction and Development), emphasizing human resources training and strengthening of the infrastructure.

During the year in review Brazil imported animals, animal products and by-products from 23 countries including Argentina, Belgium, Bolivia, Canada, the USA, New Zealand, Paraguay and Uruguay.

Concerning exports, authorities reported only on the total of meat exports, which amounted to 300,000 tons. That brought in US$642.6 million dollars. Exports went mainly to the USA, Italy, Iraq, Germany, Iran and England.

In the area of international cooperation, two meetings were held about the implementation of the Subregional Program for the Eradication of FMD in the Plata Basin. The Program involves Argentina, Uruguay and the PAHO/WHO; the Brazilian Minister of Agriculture was elected as President of COHEFA.

COLOMBIA

Colombia has a surface area of 1,141,748 Km^2. The Ministry of Agriculture and the National Administrative Statistics Department (DANE) indicate the existence of 502,185 cattle herds comprising an estimated cattle population of 23.97 million head (in 1987), 2.49 million sheep, 2.44 million pigs, 2.45 million equines and 950,000 goats.

The FMD Control Program implemented by the ICA covers the entire nation. Its priorities are the protection and expansion of the virus-free and disease-free zones, as well as the control of the disease in the areas having predominance of endemic and/or epiendemic ecosystems and availability of basic infrastructure and/or are subject to international animal-health agreements.

The program works through 111 field offices distributed in 9 regions. Personnel engaged in disease controls total 886 (191 professionals, 385 technical asistants and 310 administrative assistants). 54 of the personnel are assigned at the central level and 16 to laboratory tasks directly related to vesicular diseases. The preceding figures do not include the personnel of the diagnostic laboratory network and its 145 employees. The motor pool totals 374 vehicles (162 jeeps and 212 motorcycles), plus 16 mobile units and two trucks.

Funding during the year totalled US$11.2 million dollars. Almost half of that amount (US$5.4 million) was government money utilized mostly (92.0%) to cover operating costs. The US$5.84 million in private funds is based on the number of doses administered and recorded by the ICA (13,322,172), which is only a part of the total of vaccinations given. Sales of vaccines is calculated to have provided US$4.64 million, with an additional US$1.7 million from "vaccination costs."

25.8 million doses of FMD vaccine were produced in 1988. 2.4 million were oil-adjuvant, the rest saponin-hydroxide vaccine. The vaccines are subjected to sterility and innocuity tests, and to physico-chemical tests, as well as potency tests utilizing the footpad lesion generalization test in cattle. Two batches of the saponin-hydroxide vaccine were rejected; the results of the control of 2 million doses of saponin-hydroxide vaccine are pending. In 1988 a private laboratory was authorized to produce both saponin-hydroxide and oil-adjuvant FMD vaccines.

In consonance with the overall control strategy, the vaccination scheme is semiannual in the northwestern part of Antioquia, a large part of Cundinamarca, Nariño, north of Bolivar and Atlántico: once a year in the Amazon trapezoid bordering Brazil and every four months in the rest of the country. This scheme will be altered as the availability of oil-adjuvant vaccine increases.

Epidemiological surveillance is one of the major concerns of the Program. A national network covers the entire country and enjoys the participation of other services and agencies apart from the ICA.

The livestock that is mobilized and moved to farms, auctions, shows and slaughterhouses must be handled according to certain health requisites. The carrier must first obtain a "Movement license", of which 256,526 were issued during the year. Slightly more than 3.34 million animals were therefore moved in 1988. Additionally, 2488 cattle were imported, all of them from countries free of FMD. More than 200,000 doses of bovine semen were likewise imported.

Personnel training was largely conducted in-country. Events included a seminar-workshop on exotic diseases, two courses on epidemiology and epidemiological surveillance, and two on attention to foci of vesicular diseases. In each region, the ICA and the respective animal health agencies scheduled and conducted numerous courses and seminars especially for training field personnel. On the international level, three professionals received in-service training in information systems, laboratory techniques and laboratory animals.

International coordination is an ongoing activity with the bordering countries, and with the EEC, OIE, JUNAC, IICA, FAO and PAHO. The last agency supports specific agreements through the PAFMDC and Zoonosis Centers. Of special importance is Colombia's cooperative project with the USDA (ICA-USDA Project), through which activities have been expanded to an area with approximately 4 million head of cattle.

CHILE

The program to prevent the entry of FMD and other exotic diseases covers the entire country and its animal populations that include: 3,371,140 cattle, 4,954,800 sheep, 1,134,516 goats, 1,110,290 pigs, 443,991 equines and 126,173 camelidae. There are slightly more than 189,044 cattle herds.

The prevention program is based on a System of Epidemiological Surveillance and Controls at the sites of "possible introduction of greater risk". Those sites include ports, airports, border stations and crossings, livestock assembly areas (shows, auctions, slaughterhouses), animals used at ports and airports and animals physically close to such sites or that might come into contact with left-over foods from ships and planes. Other high-risk sites are the mountain summer pastures bordering Argentina and in the highlands bordering Peru and Bolivia. The prevention infrastructure maintains 44 international check stations, of which 18 are at seaports, 7 at airports and 15 on the borders.

Educational programs also seek to teach the communities how to reduce the risks of bringing in and/or spreading the disease. The programs target not only the groups directly involved in the problem --like the owners of animals living in the Andes, the owners having animals in the summer and winter pastures, and the livestock management personnel-- but also the public in general. Joint activities in this sense are held in conjunction with the Forces of Order and Safety, to familiarize them with the activities of the Agriculture and Livestock Service and create an awareness of their important responsibility in controlling checkpoints and patrolling borders and uninhabited areas. They are also instructed how to support controls at the SAG checkpoints and become aware of the system for controlling summer pastures and the legal measures

applicable in cases of illegal entry of animals or presence of suspected animals.

Although free of the FMD-virus since January 1981, Chile was affected by the disease in 1984 and again in 1987. On both occasions the disease was eliminated by means of animal slaughter of susceptible animals, both contact and diseased animals. The last case was recorded in August of 1987, but Chile regained its status as a disease-free country again on April 28, 1988. FMD occurs sporadically in the region bordering Argentina. In the provinces of San Juan, Mendoza and Neuquén there are summer pastures also used by Argentina cattle. This is a permanent risk for Chilean animals and has impelled the health authorities to adopt a strict prevention strategy between the V and IX Regions. That strategy is based on:

a) establishment of an unpopulated buffer strip in the high Andes;

b) reducing the number of animals in summer pastures;

c) strict controls of summer pastures when the animals are moved up to them, during their stay there, and when they descend;

d) active surveillance in summer pastures for early detection.

To carry out this Program the SAG has 54 field offices, each covering some 14,034 Km^2, 3501 cattle herds and 62,429 head of cattle. There are 179 persons engaged in the activities: 55 professional staff, 103 technical personnel, 21 administrative personnel. The motor pool operates 23 vehicles. The budget was US$394.300 for operating costs and US$52,900 for capital expenditures.

At the request of Chile, the PAFMDC prepared and keeps on hand 50,000 doses of oil-adjuvant vaccine produced with Argentina/79 and /81 virus type for emergency use.

During 1988 in-country training was given to 54 staff members, while 5 studied abroad. Training involved epidemiology, control of animal shows and fairs, quarantine, exotic diseases, diagnosis of viral diseases and biotechnology.

Sanitary education activities included 139 lectures and talks for a public of 3071 persons, and 208 meetings involving 931 participants. Of major importance was the "Project in Animal Health Sanitary Education for Schools" iniciated in 1984 jointly with the Regional Secretariat of Education. Under the SAG supervision, it involved the VIII Region, encompassing 81 education establishments, 136 instructors and 2896 students in the application of instructional units. It is expected that the

program will be extended to other regions of the country as funds become available.

On the international trade ledger, Chile imported equines mainly from Argentina; pigs from the USA; semen from Canada, the USA, England and New Zealand; beef from Argentina and Paraguay; pork from Canada, USA and Sweden; milk from Argentina, Belgium, New Zealand and Uruguay.

The main exports were: cattle to Peru; equines to Brazil and the USA; pigs to Bolivia; camelidae to Brazil (528) and Ecuador (100); mutton to Saudi Arabia, Spain, Netherlands, Italy and Iraq; milk to Bolivia, Panama and Sweden.

On the international level, contacts were maintained with various organizations such as the FAO, OIE, IICA, the Weybridge and Pirbright Reference Laboratories in England; the Plum Island Animal Diseases Laboratory in the USA; SELAB in Argentina and the PAHO/WHO in Brazil.

Four meetings were held with Argentina, fundamentally seeking to materialize an inter-country project in the Andes Mountains whose goal would be to eradicate the disease in the provinces of San Juan, Mendoza and Neuquén. This would push the epidemiological frontier toward the interior of Argentina.

ECUADOR

The animal-health Program covers the entire country --267,000 Km^2. In 1987, figures from the National Institute of Statistics and Censuses indicate the existence of 247,885 cattle herds and an animal population of 3.88 million cattle, 1.28 million sheep, 0.26 million goats, 0.61 equines and 1.62 pigs.

345 personnel are engaged in the Program, of whom 94 are professional staff, 205 technical assistants and 46 administrative personnel. These include field and laboratory personnel. 42 are assigned to the central levels, the rest at five regional offices, 19 service agencies and 52 localities. The motor pool comprises 51 vehicles, with substantial quality and quantity restrictions. The 52 operating units cover an average of 5134.6 Km^2, 4767 cattle herds and 74,694 head of cattle.

The central government provided funding totalling 233.44 million sucres, of which 6.0 million covered capital outlays. The rest covered operating expenses, 61.34 million being own funds and 166.1 million being State funds.

For epidemiological reasons, plus shortage of physical and economic resources and unavailability of FMD vaccine, not all the cattle population is under a systematic vaccination program. However, it is estimated that 60,000 herds and 1.1

million cattle (24.1 and 27% of the national total) are covered by that activity.

Vaccine production in 1988 totalled 1,020,000 doses, some 15% less than in 1987. That total included 420,000 doses of bivalent saponin-hydroxide vaccine produced by the Izquieta Perez Laboratories subjunct to the Ministry of Health, and 600,000 doses of oil-adjuvant vaccine from the PAFMDC. A total of 1,019,239 doses were administered, 90% of them directly by the official service on a semi-annual basis. The cattlemen pay for the vaccine, which is acquired by the official service at US$0.13 per dose of saponin-hydroxide vaccine and US$0.31 per dose of oil-adjuvant vaccine.

The transit of animals is permitted only with a Health Permit issued by the official service, prior presentation of an FMD vaccination certificate as proof that the animals were vaccinated at the originating farm or ranch. In 1988 transit was authorized for 291,320 cattle 127,900 pigs and 53,757 sheep. 58.2% of the cattle were bound for slaughter and 24.4% for commercialization at auctions and fairs. Only 43 cattle were imported during the year, distributed among the USA, Canada and Colombia. The importation of semen from the USA, France and Canada was authorized.

Two members of the Animal Health program underwent training in Belém, Brazil, in a six-month course on Development of Amazon Areas. 29 veterinarians attended a seminar on Forms of Livestock Production and Foot-and-Mouth Disease Ecosystems, held in Huaquillas, province of El Oro. It was sponsored by the PAFMDC and Peruvian professionals also participated.

The program obtained from the country's highest authorities a formally expressed support of the Hemispheric Program of Foot-and-Mouth Disease Eradication in South America. It took the form of an official communication from the Minister of Agriculture to the Director of the PAFMDC.

Ongoing coordination with other programs and agencies, particularly with the National Hygiene Institute of the Ministry of Health; the Technology Transfer Program (PROTECA); the Livestock Program (PROFOGAN) and the National Livestock Program; the National Council on Science and Technology (CONACYT) and the National Semen Company (ENDES). International relations are maintained and technical cooperation received from the Zoonosis Center and the PAFMDC, both of which are PAHO/WHO-related agencies; OIE, IICA, FAO and JUNAC.

Ecuador also maintains animal-health border agreements with Peru and Colombia, both with PAFMDC/PAHO cooperation.

PARAGUAY

The National Animal Health Services (SENACSA) maintains an FMD control program that covers the entire 406,752 Km^2 of the country and its 108,557 cattle herds totalling a cattle population of 7,779,558 animals.

12.4 million doses of vaccine were produced and controlled; 100% were approved. 1.23 million doses were the oil-adjuvant type, part of which was exported to Bolivia and the Philippines. Total vaccine availability in 1988 amounted to 13.6 million doses.

Vaccination inspection covered 30% of the herds over 100 head and 20% of the herds under 100 head. On the average, slightly more than 103,000 herds were involved in each vaccination period.

Oil-adjuvant vaccine is used in the areas under the Pilot Plans of Quyquyhó, Caapacú, the Mennonite Colonies in the western and eastern regions, seven districts of the department of Ñeembucú and the Alto Paraná.

The sanitary control of cattle is carried out through 27 fixed control stations, and mobile posts. A total of 23,907 droves totalling 916,983 cattle were inspected. Likewise, 609 concentrations of animals, mobilizing 6947 droves and 136,620 cattle, were controlled.

Imports in 1988 brought in animals mainly from Argentina, Brazil, and Uruguay; fowl from Argentina, Brazil, Netherlands and Italy; semen from Germany, USA and France, and embryos from Germany and the USA. In turn, fish was exported to Germany, Belgium, China and the USA; cattle and equines to Argentina, Brazil and Uruguay; meat mainly to Saudi Arabia, Brazil, Chile, Egypt and Peru.

SENACSA develops its activities through 47 regional operating units and 556 personnel, of whom 144 are professional staff, 225 technical assistants and 187 administrative personnel. 150 personnel are attached to the central level, 85 to the laboratory, and 321 in the various zones into which the country is divided for the program's purposes. The motor pool includes 91 vehicles, of which 47 are cars, pickups or similar vehicles and 44 are motorcycles.

Each operating unit therefore covers an average of 8654 Km^2, 2310 cattle herds and 165,553 head of cattle.

SENACSA's operating costs reached 1.2 million dollars, and capital outlays totalled 650,000 dollars. These figures were similar to 1987. No information is available on the expenses in the private sector.

In the area of training, 134 professional staff participated in courses targeting animal-health program management, control of rabies, evaluation of oil-adjunvant vaccine in the field, and computers. Additionally, 90 professional members of the Program participated in the First National Congress of Veterinary of Paraguay. Six professionals studied abroad, including a masters degree involving three-year study in bacteriology in England.

Regarding sanitary education and extension activities, 37 meetings were held with rural producers; 1850 persons were involved. 35 meetings with education institutions likewise involved 600 elementary students, plus 90 teachers and 2500 students from the secondary school levels.

The country maintains close coordination with national organizations, as well as with the Animal Health Services of the neighboring countries. With PAFMDC cooperation, Paraguay continues studying the possibility of implementing an FMD virus free project in the northwestern part of the country, a zone today considered as disease-free. Moreover, as part of the Southern Cone-Plata River Basin subregion, Paraguay in orienting its program toward the subregional and hemispheric goal of FMD eradication.

PERU

On Peru's 1.282.120 Km^2 there are approximately 463,182 cattle herds with 3.39 million head of cattle. Other economically important species are sheep (13.1 million head), camelidae (3.5 million), pigs (2.1 million), goats (1.7 million) and equines (1.2 million).

The FMD Control Program is under the direction of the Livestock Health Bureau of the General Bureau of Livestock and Cattle of the Ministry of Agriculture. Coverage is national, albeit very limited due to financial reasons and restrictions of an adiministrative and financial nature in the availability of some inputs, such as FMD vaccines.

135 field operating units are distributed throughout 24 departamental agrarian units. Human resources total 520 personnel, of whom 93 are professional staff, 389 are technical personnel and 38 are administrative assistants. Laboratory personnel are excluded as no information was available on them. The motor pool operates 56 jeeps and 164 motorcycles. In 1988 no data was available on the budget or actual expenditures of the program.

No FMD vaccines were produced in 1988. Such production is under the responsibility of the National Health Institute of the Ministry of Health. The available vaccine was obtained through donations from Uruguay and the PAFMDC; the latter

provided 30,000 doses. 25,000 doses of oil-adjuvant vaccine were also acquired through the PAHO, mainly through cattlemen's funds. This situation caused the official services to limit strategic vaccinations, totalling 88,020, in the Piura, Lima and Puno areas.

In 1988 Peru imported 51,079 cattle, mostly from Brazil, the USA, Cuba, New Zealand, Argentina, Uruguay, Canada and Holland. Likewise, 35,512 sheep were brought in from Uruguay, New Zealand and Cuba, and 2615 pigs from Cuba, Canada and Colombia. 105,320 doses of cattle and pig semen from the USA, Canada and West Germany were also imported.

Despite the severe financial shortcomings, financial cooperation from the PAFMDC/PAHO enabled two professional staff to attend the course on diagnosis of vesicular diseases and control of FMD vaccines, held in Rio de Janeiro. Also with support from the PAHO and the IICA, 33 veterinarians from the agriculture and animal-health sector participated in a seminar-workshop on handling oil-adjuvant FMD vaccine and bovine tuberculosis and brucellosis, held in the departament of Trujillo.

The epidemiological surveillance activities were seriously hampered, as a series of field and laboratory research. This situation could develop into a high-risk situation allowing the disease to increase and spread.

Nevertheless coordination continued on both the national and international levels, especially through meetings of the Animal-Helth Border Agreements with Bolivia and Ecuador. Other meetings also focused on financial and technical cooperation involving the PAHO, PAFMDC, JUNAC, IICA, FAO, OIE and IDB.

URUGUAY

The national FMD control program covers the nation's entire 162,500 Km^2 and the animal population of 57,000 herds, 10,408,000 cattle, 26,049,000 sheep, 250,000 pigs, 12,000 goats and 469,197 equines.

The sanitary control policy in 1988 was based on vaccination with classical vaccines three times yearly, involving cattle (about 9,300,000 per stage) and only the sheep on the farms neighboring the outbreaks. Through the CONAPROLE-MGAP agreement, cattle over 24 months of age are vaccinated once a year with oil-adjuvant vaccine, while cattle under 24 months are vaccinated twice a year. Timely attention is given to foci and epidemiological surveillance, all with the ongoing participation of the rural producers.

Vaccine production reached 45,088,875 doses, all of which was subject to quality control. 81.0% of the total (36,588,120 doses) were approved. 380,800 doses were exported

and 150,000 doses of oil-adjuvant vaccine imported from the PAFMDC/PAHO.

Uruguay's FMD program engages 535 personnel, of whom 99 are professional staff and 436 technical and administrative personnel. Field activities engage 65 professionals and 340 assistants. The motor pool includes 168 vehicles. There are 41 field units, each covering 3963 Km^2, 1390 cattle herds and 253,854 head of cattle. Each field unit therefore averages 1.6 veterinarians, 8.3 auxiliary personnel and 2.6 vehicles (cars and motorcycles).

The Report sent by Uruguay to COSALFA contains no data on:

- funds budgeted and disbursed, by source of funds;
- training in the country and abroad;
- sanitary education and dissemination activities;
- national and international coordination and agreements.

With regard to international trade, Uruguay imported cattle from Canada, the USA and England, equines from Spain and France, and semen from Canada, the USA and England.

Exports included cattle, equines and sheep to Argentina, Brazil and Paraguay; cattle to Bolivia; sheep to Libya and Peru; equines to Ecuador, Spain and Italy; semen to Argentina; and meat to Argentina, Brazil, Peru, Italy, Spain, USA, Chile, Saudi Arabia, Kuwait, Iran, Federal Republic of Germany, Belgium-Luxemburg, France, Netherlands, United Kingdom, Greece, Antigua, Barbados, Dominica, Jamaica, San Cristobal, Puerto Rico, Netherlands Antilles, Bahamas, Caiman Islands, Switzerland, Canarias Islands, Hong Kong, Malta, Egypt, Cyprus, Iraq, Israel, Jordan, Congo, Ivory Coast, Gabon; milk to Argentina, Brazil, Mexico, South Africa, URSS, Saudi Arabia, Kuwait, Iran, Cuba, Venezuela and Colombia.

VENEZUELA

The responsibility for FMD control belongs to the Ministry of Agriculture, which operates through a central level and 22 agriculture and livestock development units. In order to carry out the tasks related to animal health, an Animal Health Bureau acts through 150 offices (operational units) through which FMD control activities are given nationwide coverage. The V Agriculgure Census (1985) indicated that Venezuela then had 105,735 cattle herds, totalling 10.8 million head of cattle. That same year, other animal species included 2.64 million pigs, 1.29 million goats, 351,000 sheep, 557,000 equines and approximately 14,000 bubalinos.

To conduct the animal health activities, including FMD control activities, the official services engages 385 personnel (177 professionals, 55 technical assistants and 153 administrative personnel). Of these, 11,1 and 3 are respectively assigned to the central level and 314 vehicles. The funds available for operating costs for the first eleven months of the year were US$683,293.80. The private sector in 1988 provided approximately US$3,085.713, of which 83.3% came from vaccine sales. The remaining amount came from the costs of conducting the vaccinations.

Considering the country's total of 911,930 Km^2, each of the 150 field offices averages 6080 Km^2, 705 cattle herds and 72,213 head of cattle.

Foot-and-mouth disease vaccination targets on the risk zones where the disease occurs sporadically. It is massive and systematic in those areas where factors favor seasonal outbreaks (epiendemic areas), and in the primary endemic areas, where ecological conditions, infrastructure and resources permit.

Part of the vaccine used was attenuated live-virus vaccine produced by the Veterinary Research Institute of the National Agrolivestock Research Fund (FONAIAP) and the other was oil-adjuvant vaccine imported mainly from Brazil. A total of 7.8 million doses of vaccine was produced; the volume of modified live-virus vaccine doses rose to 6.4 million. 4.3 million doses of oil-adjuvant vaccine were imported, and the country had on hand 358,750 doses left from 1987 of which 350,000 doses were modified live-virus type. All in all, 11.3 million doses of vaccine were available.

10,154,900 doses were distributed for use in 1988. Officially, only oil-adjuvant vaccine is used in the states of Bolivar, Monagas, Sucre and the Delta Amacuro Federal Territory. That type of vaccine is also used on farms and ranches in the central-western zone on mostly dairy herds and in the states of Zulia and Táchira. There are no fixed periods of vaccination, and the vaccination records are incomplete and normally late. It is estimated that the official services conduct approximately half of the vaccinations.

The nationally produced vaccine is submitted to the usual quality controls (infectious titre, complement fixation, sterility, pathogenicity). Its contagiousness in susceptible cattle is also assessed. Imported vaccine is subjected to tests of potency and innocuity, complement by examination of the production and official control records from the country of origin.

Work progressed on the building and equiping of an industrial plant for production of oil-adjuvant vaccine, while a pilot plant for production of the same type of biological is implemented.

A working group was formed during the second half of the year to draw up a proposal for the "National Foot-and-Mouth Disease Control Program." The national strategies and objectives are to be compatible with those of the "Hemispheric Program for Foot-and-mouth Disease Eradication" agreed by all the countries.

Other activities were developed in the campaign against FMD and other diseases, such as control of cattle transit, attention to foci including laboratory diagnosis, sanitary education and dissemination, sanitary control at ports, airports and bordercheck stations, epidemiological surveillance and personnel training.

Regarding epidemiological surveillance, progress continued on updating and implementing the information sub-system, including computerizing the data processing aspects.

Great emphasis was given to personnel training, both in and out-of-country. In Venezuela, 25 professional staff attended a 2-week seminar-workshop on "Use of oil-adjuvant FMD vaccine in the Eradication Program." The event was conducted with cooperation from the PAFMDC/PAHO in Maracaibo, Zulia. 59 veterinarians also underwent a one-week training course in "Principles of Epidemiology" and another lab specialist took a month training in Laboratory Diagnosis. Moreover, at the PAFMDC in Rio de Janeiro, two specialists participated in the 10-week course on "Diagnosis of the Vesicular Disease" and "Control of FMD vaccine". Additionally, five professional staff were trained in vaccine production and two in laboratory equipment maintenance.

Venezuela imported a total of 37,959 cattle from Australia (2230), Canada (12,429), Costa Rica (3615), Colombia (37), Cuba (1875), the USA (6163) and New Zealand (11,610). Semen was imported from Australia, Canada, the USA and England. Food imports included 5959.5 metric tons of meat and 92,926,1 of milk.

The Animal Health Division maintains relations inherent to its objectives and mission with other national Ministries: Production, Treasury, Health and Social Assistance, Foreign Relations, Interior Relations, Environment and Natural Resources, the National Hygiene Institute, National Agrolivestock Research Fund, National Institute of Hippodromes, and several universities and other Venezuelan public and private entities.

On the international level, border health agreements are maintained with Brazil, Colombia, and Guyana, as well as Technical Cooperation agreements with FAO, IICA, JUNAC, OIE and PAHO.

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

3.1 Results in South America

As in preceding years, the behavior of vesicular diseases in South America in 1988 was continuously monitored by means of a system of indicators that enable analysis to characterize and interpret the levels of occurrence and the behavior of the virus types. The history of vesicular disease occurrences stored in the PAFMDC data bank is used to interpret the significance of the weekly frequencies of vesicular diseases recorded on a grid map, the frequency of affected herds, and virus types, based on each country's political and administrative subdivisions.

In 1988, grid squares affected by vesicular diseases indicated new occurrences lasting for more than 15 weeks in Colombia's western and central-south region and in Brazil's northeastern region. The frequency representing new outbreaks for more than 15 weeks in the same grid has, since 1980, ranged between 1% to 3%. In 1988 it dropped to 0.6%.

Table 5 shows for each country on the continent the months when the recorded frequency of herds affected by some type of virus significantly exceeded the expected frequencies. Such situations may be regarded as epidemiologically significant or epidemic.

3.2 Performance in South America

This section assesses the operating performance of communications within the Continental Epidemiological Information System, especially with respect to the regular flows of information between the national animal-health services in South America and the PAFMDC.

3.2.1 Alert notices

Alert notices were frequently telexed or telegraphed in 1988 to various countries on the continent to warn them of the appearance of vesicular diseases in border areas of neighboring countries, as well as the appearance of the disease in previously unaffected areas.

3.2.2 Weekly information transmittal on the presence of vesicular diseases, by grid square

Personnel engaged in national control programs are 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 communicating the presence of vesicular disease (regardless of the number of episodes). A

numerical code indicates both the week reported and the grid squares affected. The PAFMDC prepares the code annually and distributes it to each country before the beginning of the year. The telegraphed or telexed notice serves as data input for the PAFMDC's epidemiological file stored in a computer. The PAFMDC issues the Weekly Epidemiological Report for distribution to countries and international agencies in South America and elsewhere.

a) Reporting level

The weekly communications sent in by the South American countries in 1988 reached a reporting level of 98%, an adequate level in relation to preceding years: 1987 (98.8%), 1986 (98.7%), 1985 (99.8%), 1984 (99.6%), 1982 (97%), 1981 (96%), 1980 (99%) and 1979 (97%). The PAFMDC received an average of 50.8 weekly communications out of the 52 weeks on the codified reporting calendar. Only Argentina, Peru, Uruguay and Venezuela failed to forward 100% of their reports (Table 41).

b) Publishing level

Considering the data received by the PAFMDC, 96.3% of the weekly reports were published, an increase over the 86.5% attained in 1987 (Table 41). Although the PAFMDC published weekly data arriving after the deadline, it should be noted that some countries showed --mainly by Peru-- a tendency not to comply with report deadlines.

c) Prompt transmittal of weekly communications

Argentina, Bolivia, Brazil and Peru --especially the first and last-- were extremely lax in submitting their weekly reports on time in 1988. The average days of delay (20, 12, 10 and 77, respectively) are not in harmony with the purpose of the weekly report. On the whole, however, overall reporting promptness improved (average of 14.5 days). The delays noticed in the case of certain countries are incompatible with the fast, simple and systematic processing of epidemiological information and with the coherent regularity that ensures proper monitoring and surveillance of the behavior of an acute, easily-spread disease.

3.2.3 Montly information on vesicular disease episodes and their laboratory diagnosis

This information reports on the number of herds affected, according to each country's political and

administrative divisions, as well as the number of affected herds from which specimens were collected and its distribution according to the type of virus indentified.

a) Reporting and publishing levels

The reporting and publishing levels in 1988 dropped to 90%, indicative of a lag in comparison to 1987 (100%) (Table 42). This overtly denotes a decline in the performance of the continental system for epidemiological surveillance of FMD. Particularly disappointing is the poor performance by Venezuela (only 7 montlhy reports sent in).

b) Monthly reporting delays

Regardless of the number of monthly reports not sent in, Argentina, Bolivia and Uruguay shortened their overall delays in forwarding their Monthly Epidemiological Reports to the PAFMDC (Table 43). Likewise, delays were generally shorter for the first 8 months of the year, although the countries' individual reporting lags varied greatly. On the whole, Argentina, Colombia and Uruguay complied at acceptable levels, posting delays of approximately one month. But the remaining South American countries delayed their compliance excessively in view of the important objectives pursued with this type of information.

In general, the monthly reporting system continues to suffer from the same shortcomings noted in previous years. The delay in transmitting reports to the PAFMDC has, in several cases, become crucial. Countries are repeatedly failing to provide the epidemiological comments required for data interpretation and to locate the virus types on the grid map. In some instances, countries have altered the formats of monthly communications, thereby hampering data compilation by disturbing the uniformity of the monthly report on vesicular diseases.

3.2.4 Surveillance activities: Laboratory Confirmation

Specimens were collected for laboratory diagnosis in 52% of herds with animals having clinical symptoms of vesicular disease in 1988. Argentina, Colombia, Paraguay and Uruguay were above average in performing this field work. Generally, the rate of laboratory specimens collected slipped in relation to 1987 (Table 44).

Virus identification was accomplished in only 35% of the herds showing clinical signs of vesicular disease; a total lower

than the 40% posted in 1987. These rates, it should be realized, are low in any regard. Additionally, some countries reached very low rates of virus identification, and there are others that report very few vesicular episodes. Moreover the causal agent was identified in 68% of the outbreaks in which samples were collected. The range of positive identification went from 47% to 80% depending on the country.

The monthly communication of information on active virus subtypes must be improved. This is a very important requirement for providing information to COSALFA countries, international agencies and other countries. The EEC has insistently required this information.

3.3 Performance in Central America and Mexico

This section assesses the operational performance of the Continental Epidemiological Information System, regarding communications from the national animal-health services of Central America and Mexico to the PAFMDC, which is the organization entrusted with coordinating this system.

3.3.1 Weekly communication on the presence of vesicular disease, by grid square

The map of each country in this region of the American continent has also been subdivided into a grid map based on geographic coordinates. The maps serve as guides for weekly telex notification of the presence of vesicular disease (regardless of the number of episodes). A numerical code is utilized to indicate both the week reported and the grid squares affected, like the system used for South America.

a) Reporting level

The number of weekly reports received from Central American countries and Mexico in 1988 dropped to 77.2% when compared to 1987 (91%). Belize, which does not report, is excluded. Among reporting countries, Nicaragua posted the lowest level. Considering the six countries that did forward weekly reports, the Center received reports for an average of 40.1 weeks, of 77.2% of the 52 weeks included on the coded reporting calendar (Table 45).

b) Publishing level

Considering the number of reports received by the PAFMDC, 69.3% of the epidemiological weekly reports were published, even though it publishes reports that are received late. The number of weekly reports published in 1988 was slightly lower than in 1987 (Table 45).

c) Prompt transmittal of weekly communications

In general, the countries delayed their weekly reports longer than in 1987. Mexico was the country that least delayed forwarding its weekly report to the PAFMDC (Table 45).

3.3.2 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, as well as the number of affected herds from which laboratory specimens were collected, according to the type of virus identified.

a) Reporting and publishing levels

The countries of the region generally achieved good monthly reporting levels in 1988, although Mexico failed to forward two monthly reports (Table 46).

b) Monthly reporting delays

Considering the overall experience in South America, the monthly reporting delays by Mexico and the Central American countries in 1988 were generally acceptable (Table 47).

3.3.3 Surveillance activities: Laboratory Confirmation

47.4% of all the herds affected by vesicular disease in 1988 yielded positive results in laboratory diagnosis. Almost all the countries, but especially Guatemala, performed favorably in this activity in which field work is of the utmost importance. Mexico's performance lagged, however, behind last year's (Table 24).

3.3.4 Support from the Vesicular Diseases Diagnosis Laboratory (LADIVES) in Panama

The LADIVES in Panama continues functioning normally. This laboratory sends the PAFMDC a monthly report on the results of virus typification and geographically indicates the department or province where the typified virus episode has occurred.

3.4 Notification system for suspected diseases clinically similar to Hog Cholera (PAFMDC/PAHO/IICA)

Regarding the suspicion of diseases clinically similar to hog cholera, the Continental Surveillance and Information System coordinated by the PAFMDC has, in recent years, had the

participation of the majority of the Latin American countries in the mechanism of weekly telexed reports based on grid maps.

This is a joint undertaking of the PAHO/PAFMDC and the Inter-American Institute for Agricultural Cooperation (IICA), realized through the gathering and dissemination of information related to hog cholera. This system's performance will gradually be improved, especially to the extent that national programs develop properly and implement their information systems, utilizing current mechanisms and their experience with vesicular disease.

The IICA issues an annual report containing the above information.

3.5 Recommendations

The following points should continue to be stressed:

a) Carefully maintain and improve the epidemiological information system. It is a valuable working asset for all the countries of the continent, a vital support mechanism for their programs, and one of the most important animal-health accomplishments in South America. Every possible effort must be made to prevent declines in the system and its performance.

b) Reduce in transmitting weekly and monthly reports to the PAFMDC.

c) Ensure that the information generated by the system is timely and reliable, and that communications follow standardized format and procedures.

d) Pay more attention to the use of the information as an objective base for the epidemiological characterization of FMD and subsequent readjustment of control goals and strategies, as well as in the forecasting, recognition and monitoring of epidemic situations and their solutions.

e) Include monthly information on virus subtypes identified and their location on the map. This requires permanent integration and a close working relationship between field and laboratory.

f) When epidemic situations occur, keep the PAFMDC continually informed. It is the reference body for consultation by neighboring countries, international agencies and other countries. Complete information should be forwarded at least weekly, showing not only 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. Omission of information on proven foci constitutes serious error and damages the reliability and credibility of the veterinary services.

g) Encourage a more fully integrated working relationship between the laboratory and central- and field-level epidemioligists, in pursuit of the correct inclusion of information on virus type and sybtypes and their repercussion on FMD epidemiology.

h) Forward field specimens regularly to the PAFMDC for the reference laboratory.

i) Take prompt action and apply timely and effective corrective measures when seroepidemiological information leads to the detection of serological and immunological variations in the active field strains.

j) It is clear that greater attention must be focused on preparing the information sent in for the annual report on the situation of FMD and its control in the countries. The majority of the countries' reports sent to COSALFA present problems that indicate that the reports are being regarded as routine matters, and are not being so carefully and duly prepared as they ought to be.

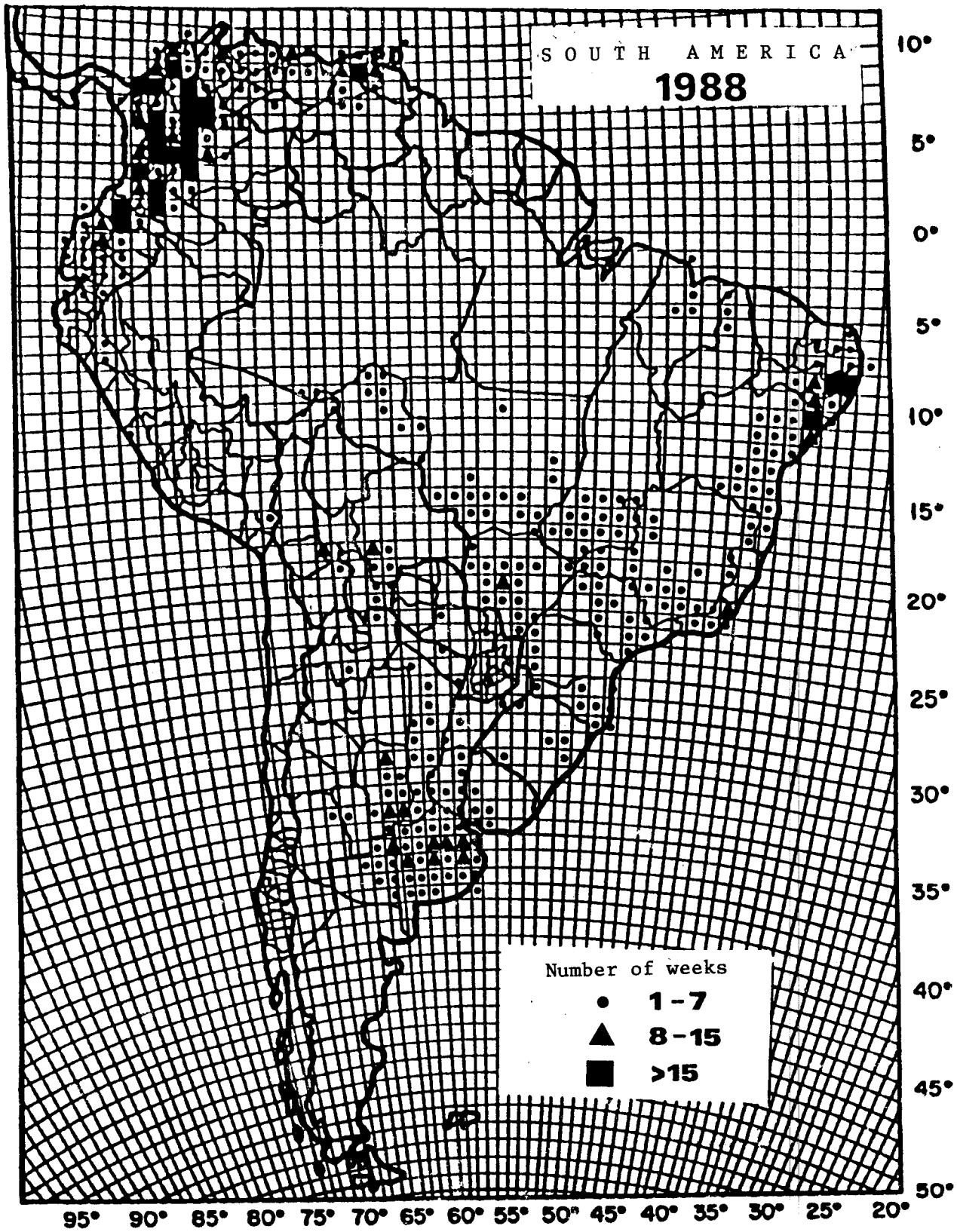

FIGURE 1. Distribution of number of weeks with vesicular diseases occurrence, by geographic coordinates.

TABLE 1. Number of establishments affected by vesicular disease (by causal agent). South America, 1988.

Country	Establish. Affected	Establish. Affected with Collection	Diagnosis				
			Foot-and-Mouth			Vesicular	Stomatitis
			O	A	C	New Jersey	Indiana
Argentina	365	256	95	35	5	-	-
Bolivia /1	65	26	-	13	4	-	-
Brazil /2	1,255	356 /3	92	91	19	-	4
Chile	-	-	-	-	-	-	-
Colombia	1,577 /4	1,104	268	153	-	250	184
Ecuador	97	42	2	15	-	3	1
Paraguay	3	3	2	-	-	-	-
Peru	68	23	1	6	-	7	-
Uruguay	10	10	2	-	6	-	-
Venezuela	228	91	6	10	-	27	-
Total	3,668	1,911	468	323	34	287	189

Notes: /1 BOL - Includes 6 outbreaks in the departaments of Chuquisaca (3), Tarija (2) and Beni (1), not covered by SENARB.
/2 BRA - Includes 246 outbreaks in the area not covered by program.
/3 BRA - Outbreaks with sample collections but no laboratory diagnosis are not included.
/4 COL - Includes 31 outbreaks without identification of affected species.

TABLE 2. Establishments affected by foot-and-mouth disease based on virus type by country and year. South America, 1988.

Country	Virus Type	1982	1983	1984	1985	1986	1987	1988
Argentina	O	13	351	90	10	30	23	95
	A	39	23	6	5	11	486	35
	C	4	196	348	288	315	27	5
Bolivia	O	-	1	3	6	3	-	-
	A	3	1	8	-	11	12	13 /1
	C	7	3	1	3	-	1	4 /2
Brazil	O	85	61	82	127	126	94	92
	A	589	190	144	113	102	161	91
	C	13	22	19	25	17	13	19
Colombia	O	50	192	164	98	167	100	268
	A	79	32	78	402	276	73	153
	C	-	-	-	-	-	-	-
Chile	O	-	-	13	-	-	135	-
	A	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-
Ecuador	O	9	66	13	5	6	2	2
	A	35	47	29	16	19	11	15
	C	-	-	-	-	-	-	-
Paraguay	O	6	11	22	1	4	3	2
	A	13	1	-	-	-	-	-
	C	1	-	6	7	-	-	-
Peru	O	-	-	-	7	-	-	1
	A	6	1	4	11	17	10	6
	C	7	3	-	-	-	-	-
Uruguay	O	1	-	10	15	2	2	2
	A	2	1	-	-	1	115	-
	C	-	4	6	3	28	5	6
Venezuela	O	28	13	18	31	13	20	6
	A	13	10	7	16	8	6	10
	C	-	-	-	-	-	-	-

Notes: /1 BOL - Includes 3 outbreaks in the departament of Chuquisaca, not covered by SENARB.
/2 BOL - Includes 1 outbreak in the departament of Beni, not covered by SENARB.

TABLE 3. Foot-and-mouth disease virus subtypes identified in 1988.

Argentina	O1	A-81	C3
Bolivia	-	A24	C3
Brazil	O1	A24,A-84* A-81	C3
Chile	-	-	-
Colombia	O1	A24,A-85	-
Ecuador	O1	A24	-
Paraguay	O1	-	-
Peru	O1	A24	-
Uruguay	O1	-	C3
Venezuela	O1	A27,A24	-

Note: * A-84 São Carlos.

TABLE 4. Strains used for production of foot-and- mouth disease vaccine. South America, 1988.

Country	Virus Strains		
	O	A	C
Argentina	O1 Caseros or O1 Campos	AArg/79 A-81	C3 Arg/85
Brazil	O1 Campos-Br/58	A24 Cruzeiro and A 79-Venceslau	C3 Indaial
Colombia	O1 Campos	A24 Cruzeiro	-
Ecuador	O1 Campos	A24 Cruzeiro	-
Paraguay	O1 Campos	A24 Cruzeiro	C3 Resende
Peru	O1 Urubamba	A24 Cruzeiro	C3 Resende
Uruguay	O1 Campos	A24 Cruzeiro and A-81	C3 Resende
Venezuela/1	O1 Campos	A32 Venezuela	-

Notes: /1 Only country producing live attenuated-virus vaccine.

Source: Reports sent by countries and PAFMDC Diagnosis and Reference Laboratory.

TABLE 5. Mouths when the recorded frequency of herds affected by vesicular-disease viruses significantly exceeded the expected frequencies. South America, 1988.

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

TABLE 6. Vesicular disease morbility in cattle. South America, 1988.

Country	Herds /a		Population /a				Rates			
	Total	Affected	Total (x 1000)	In Affected herds	Diseased	Deaths	Affected Herds (0/00)	Population morbility (0/000)	Internal morbility (0/0)	Lethality (0/0)
Argentina	295,997	362	46,883.0	297,342	27,968	442	1.22	5.97	9.41	1.58
Bolivia	8,900	57	530.0	10,172 /1	332	15 /1	6.40	6.26	3.26	4.52
Brazil	1,319,684	1,000	89,596.0	185,143	28,278	509	0.76	3.16	15.27	1.80
Colombia	449,525	1,485	23,801.4	173,963 /2	24,871	294	3.30	10.45	14.30	1.18
Chile	189,044	-	3,371.1	-	-	-	0.00	0.00	0.00	0.00
Ecuador	247,855	97	3,884.1	12,404	2,346	30	0.39	6.04	18.91	1.28
Paraguay	108,557	3	7,780.0	74	23	-	0.03	0.03	31.08	0.00
Peru	463,182	68	3,392.9	9,111	626	17	0.15	1.85	6.87	2.72
Uruguay	57,000	10	10,408.0	6,891	98	1	0.18	0.09	1.42	1.02
Venezuela	105,735	174	10,832.0	49,438	5,600	57	1.65	5.17	11.33	1.02
Total	3,245,479	3,256	200,478.5	744,538	90,142	1,365	1.00	4.50	12.11	1.51

Notes: /a - Covered by program.
/1 BOL - Subject to revision.
/2 COL - Information of cattle affected in 88 establishments was not obtained.

TABLE 7. Vesicular disease morbidity in swine. South America, 1988.

Country	Population				Rates		
	Total (x 1000)	In affected herds	Diseased	Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)
Argentina	2,531.7	3,280	1,608	223	6.35	49.02	13.87
Bolivia	1,111.7	817	96	2	0.86	11.75	2.08
Brazil	32,327.3	4,964 /1	2,078 /1	511 /1	0.64	41.86	24.59
Colombia	2,440.0	6,102	1,040	163	4.26	17.04	15.67
Chile	1,110.3	-	-	-	0.00	0.00	0.00
Ecuador	1,620.1	-	-	-	0.00	0.00	0.00
Paraguay	2,107.9	-	-	-	0.00	0.00	0.00
Peru	2,141.9	1,610	82	6	0.38	5.09	7.32
Uruguay	250.0 /2	133	60	45	2.40	45.11	75.00
Venezuela	2,639.4	29,809	4,880	566	18.49	16.37	11.60
Total	48,280.3	46,715	9,844	1,516	2.04	21.07	15.40

Notes: /1 BRA - Figures from areas covered by program.
/2 URU - Figure estimated by the country.

TABLE 8. Vesicular disease morbidity in sheep. South America, 1988.

Country	Population				Rates		
	Total (x 1000)	In affected herds	Diseased	Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)
Argentina	35,237.6	120,616	38	1	0.01	0.03	2.63
Bolivia	9,413.1	453	100	-	0.11	22.08	0.00
Brazil	18,477.2	5,366 /1	470 /1	73 /1	0.25	8.76	15.53
Colombia	2,490.6	2,159	116	5	0.47	5.37	4.31
Chile	4,954.8	-	-	-	0.00	0.00	0.00
Ecuador	1,282.4	-	-	-	0.00	0.00	0.00
Paraguay	430.3	-	-	-	0.00	0.00	0.00
Peru	13,060.0	24,853	346	178	0.26	1.39	0.00
Uruguay	26,049.0	14,443	15	-	0.01	0.10	0.00
Venezuela	351.2	403	44	10	1.25	10.92	22.73
Total	111,746.2	168,293	1,129	267	0.10	0.67	23.65

Notes: /1 BRA - Figure from area covered by program.

TABLE 9. Vesicular disease morbidity in goats. South America, 1988.

Country	Population				Rates		
	Total (x 1000)	In Affected herds	Diseased	Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)
Argentina	3,100.0 /1	-	-	-	0.00	0.00	0.00
Bolivia	1,226.7	73	2	-	0.02	2.74	0.00
Brazil	9,674.6	735 /2	296 /2	81 /2	0.31	40.27	27.36
Colombia	950.2	670	6	2	0.06	0.90	33.33
Chile	1,134.5	-	-	-	0.00	0.00	0.00
Ecuador	261.9	-	-	-	0.00	0.00	0.00
Paraguay	137.6	-	-	-	0.00	0.00	0.00
Peru	1,740.1	-	-	-	0.00	0.00	0.00
Uruguay	12.0 /1	-	-	-	0.00	0.00	0.00
Venezuela	1,285.5	-	-	-	0.00	0.00	0.00
Total	19,523.1	1,478	304	83	0.16	20.57	27.30

Notes: /1 ARG, URU - Figures taken from country's report to COSALFA 1987.
/2 BRA - Figure from area covered by program.

TABLE 10. Vesicular disease morbidity in horses. South America, 1988.

Country	Population				Rates		
	Total (x 1000)	In affected herds	Diseased	Deaths	Population morbidity (0/000)	Internal morbidity (0/0)	Lethality (0/0)
Argentina	3,073.5	-	-	-	0.00	0.00	0.00
Bolivia	904.1	88	-	-	0.00	0.00	0.00
Brazil	5,442.3	-	-	-	0.00	0.00	0.00
Colombia	2,445.2	4,421	171	-	0.70	3.87	0.00
Chile	444.0	-	-	-	0.00	0.00	0.00
Ecuador	608.6	-	-	-	0.00	0.00	0.00
Paraguay	328.3	-	-	-	0.00	0.00	0.00
Peru	1,213.1	120	66	1	0.54	55.00	1.52
Uruguay	469.2	-	-	-	0.00	0.00	0.00
Venezuela	557.4	197	53	-	0.95	26.90	0.00
Total	15,485.7	4,826	290	1	0.19	6.01	0.34

TABLE 11. Monthly distribution of establishments affected by vesicular disease. South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	11	10	5	9	36	68	40	68	38	54	17	9	365
Bolivia /1	1	8	2	14	2	6	11	7	4	3	3	4	65
Brazil /2	39	81	60	92	119	162	176	242	92	75	42	75	1,255
Colombia	146	165	59	37	68	104	207	206	138	189	139	119	1,577
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	8	5	1	12	6	4	1	6	18	19	12	5	97
Paraguay	-	2	-	-	-	1	-	-	-	-	-	-	3
Peru	32	4	-	-	-	4	-	1	15	10	2	-	68
Uruguay	-	-	-	-	-	-	-	-	-	2	2	6	10
Venezuela	13	4	6	1	3	12	6	22	55	77	23	6	228
Total	250	279	133	165	234	361	441	552	360	429	240	224	3,668

Notes: /1 BOL - Includes 6 outbreaks in the departaments of Chuquisaca, Tarija and Beni, not covered by SENARB.
/2 BRA - Includes 246 outbreaks in the area not covered by program.

TABLE 12. Monthly distribution of establishments affected by FMD, virus type "O". South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	5	19	14	23	12	19	3	-	95
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	3	4	7	13	9	13	13	18	9	-	-	3	92
Colombia	11	9	5	12	14	8	22	30	38	58	25	36	268
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	1	-	-	-	1	-	-	-	-	-	-	-	2
Paraguay	-	1	-	-	-	1	-	-	-	-	-	-	2
Peru	-	-	-	-	-	-	-	-	1	-	-	-	1
Uruguay	-	-	-	-	-	-	-	-	-	1	-	1	2
Venezuela	1	-	2	-	-	2	-	-	-	-	1	-	6
Total	16	14	14	25	29	43	49	71	60	78	29	40	468

TABLE 13. Monthly distribution of establishments affected by FMD, virus type "A". South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	1	-	1	11	8	6	6	-	1	1	-	35
Bolivia /1	1	2	-	-	1	2	1	3	-	-	-	3	13
Brazil	4	5	3	2	1	16	14	35	3	-	3	5	91
Colombia	7	5	8	6	8	5	30	34	7	9	18	16	153
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	1	1	2	6	2	2	1	15
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	-	-	-	4	-	-	-	-	2	-	6
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	1	-	1	-	-	-	-	2	1	4	1	-	10
Total	13	13	12	9	21	36	52	82	17	16	27	25	323

Notes: /1 BOL - Includes 3 outbreaks in the departament of Chuquisaca, not covered by SENARB.

TABLE 14. Monthly distribution of establishments affected by FMD, virus type "C". South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	1	-	-	-	1	-	-	-	2	1	-	5
Bolivia /1	-	2	-	2	-	-	-	-	-	-	-	-	4
Brazil	1	2	3	2	4	2	1	2	1	1	-	-	19
Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	-	-	-	-	-	-	-	-	-	1	2	3	6
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	5	3	4	4	3	1	2	1	4	3	3	34

Notes: /1 BOL - Includes one outbreak in the departament of Beni, not covered by SENARB.

TABLE 15. Monthly distribution of establishments affected by vesicular stomatitis, New Jersey type. South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	44	81	26	1	3	10	18	11	19	14	15	8	250
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	-	-	-	1	2	-	-	3
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	6	-	-	-	-	-	-	1	-	-	-	-	7
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	1	1	-	-	-	1	2	-	10	9	2	1	27
Total	51	82	26	1	3	11	20	12	30	25	17	9	287

TABLE 16. Monthly distribution of establishments affected by vesicular stomatitis, Indiana type. South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	-	-	-	-	-	-	-	4	-	-	-	-	4
Colombia	17	20	7	4	10	26	32	18	6	25	8	11	184
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	1	-	-	-	-	-	-	-	1
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	20	7	4	11	26	32	22	6	25	8	11	189

TABLE 17. Monthly distribution of establishments with cattle affected by vesicular disease. South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	11	10	5	9	36	68	40	68	38	51	17	9	362
Bolivia /1	1	8	2	12	2	6	11	7	4	3	3	4	63
Brazil /2	36	80	57	92	119	160	176	242	92	75	41	75	1,245
Colombia	138	154	57	34	63	102	198	186	125	183	130	115	1,485
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	8	5	1	12	6	4	1	6	18	19	12	5	97
Paraguay	-	2	-	-	-	1	-	-	-	-	-	-	3
Peru	32	4	-	-	-	4	-	1	15	10	2	-	68
Uruguay	-	-	-	-	-	-	-	-	-	2	2	6	10
Venezuela	9	3	5	1	1	8	3	14	37	67	21	5	174
Total	235	266	127	160	227	353	429	524	329	410	228	219	3,507

Notes: /1 BOL - Includes 6 outbreaks in the departament of Chuquisaca (3), Tarija (2) and Beni (1), not covered by SENARB.
/2 BRA - Includes 245 outbreaks from the area not covered by program.

TABLE 18. Monthly distribution of establishments with cattle affected by FMD virus type "O". South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	5	19	14	24	11	16	3	-	92
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	3	4	7	13	9	13	13	18	9	-	-	3	92
Colombia	10	8	5	10	13	8	22	29	33	54	25	34	251
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	1	-	-	-	1	-	-	-	-	-	-	-	2
Paraguay	-	1	-	-	-	1	-	-	-	-	-	-	2
Peru	-	-	-	-	-	-	-	-	1	-	-	-	1
Uruguay	-	-	-	-	-	-	-	-	-	1	-	1	2
Venezuela	1	-	2	-	-	2	-	-	-	-	1	-	6
Total	15	13	14	23	28	43	49	71	54	71	29	38	448

TABLE 19. Monthly distribution of establishments with cattle affected by FMD virus type "A". South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	1	-	1	11	8	6	6	-	1	1	-	35
Bolivia /1	1	2	-	-	1	3	-	4	-	-	-	3	14
Brazil	4	5	3	2	1	16	14	35	3	-	3	5	91
Colombia	7	4	8	6	8	5	30	32	7	9	17	16	149
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	1	1	2	6	2	2	1	15
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	-	-	-	4	-	-	-	-	2	-	6
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	1	-	1	-	-	-	-	2	1	2	1	-	8
Total	13	12	12	9	21	37	51	81	17	14	26	25	318

Notes: /1 BOL - Includes 3 outbreaks in the departament of Chuquisaca, not covered by SENARB.

TABLE 20. Monthly distribution of establishments with cattle affected by FMD virus type "C". South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	1	-	-	-	1	-	-	-	2	1	-	5
Bolivia /1	-	2	-	1	-	-	-	-	-	-	-	-	3
Brazil	1	2	3	2	4	2	1	2	1	1	-	-	19
Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	-	-	-	-	-	-	-	-	-	1	2	3	6
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	5	3	3	4	3	1	2	1	4	3	3	33

Notes: /1 BOL - Includes one outbreak in the departament of Beni, not covered by SENARB.

TABLE 21. Monthly distribution of establishments with cattle affected by vesicular stomatitis, New Jersey type. South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	42	77	26	1	3	10	18	10	19	14	14	8	242
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	-	-	-	1	2	-	-	3
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	6	-	-	-	-	-	-	1	-	-	-	-	7
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	1	1	-	-	-	1	-	-	7	8	2	1	21
Total	49	78	26	1	3	11	18	11	27	24	16	9	273

TABLE 22. Monthly distribution of establishments with cattle affected by vesicular stomatitis, Indiana type. South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	-	-	-	-	-	-	-	4	-	-	-	-	4
Colombia	17	18	7	3	10	26	31	15	6	25	8	11	177
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	1	-	-	-	-	-	-	-	1
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17	18	7	3	11	26	31	19	6	25	8	11	182

TABLE 23. Monthly distribution of cattle affected by vesicular diseases. South America, 1988.

Country/ /Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina	547	160	133	1,247	3,104	6,597	2,977	6,409	1,588	3,331	1,318	557	27,968
Bolivia /1	4	74	8	10	86	36	41	32	13	23	9	39	375
Brazil /2	2,891	4,936	1,461	3,663	3,338	4,366	3,627	4,057	1,820	1,202	573	143	32,077
Colombia /3	1,591	1,563	570	366	593	1,769	3,252	3,262	2,301	2,878	4,646	2,080	24,871
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	159	100	2	166	172	120	15	629	512	301	141	29	2,346
Paraguay	-	11	-	-	-	12	-	-	-	-	-	-	23
Peru	460	101	-	-	-	39	-	1	2	19	4	-	626
Uruguay	-	-	-	-	-	-	-	-	-	21	11	66	98
Venezuela	273	87	110	108	...	58	...	830	2,684	1,054	282	114	5,600
Total	5,925	7,032	2,284	5,560	7,293	12,997	9,912	15,220	8,920	8,829	6,984	3,028	93,984

Notes: /1 BOL - Includes 35 diseased cattle in the departament of Chuquisaca and 8 in the departament of Tarija of the February outbreak. This departaments are not covered by SENARB.
/2 BRA - Includes 3.799 animals from area not covered by program.
/3 COL - Information of affected cattles in 88 establishments was not obtained.

TABLE 24. Number of establishments affected by vesicular stomatitis, by country and virus type. Central America, Panama y Mexico, 1988.

Country	Vesicular Stomatitis		No diagnosis (negative)	Total
	New Jersey	Indiana		
Belize	-	-	-	-
Costa Rica	33	5	24	62
El Salvador	27	5	24	56
Guatemala	65	10	32	107
Honduras	23	2	32	57
Mexico	16	4	115	135
Nicaragua	16	2	10	28
Panama	11	3	9	23
Total	191	31	246	468

TABLE 25. Coverage by FMD control programs. South America, 1988.

Country	Area (Km^2)		Cattle herds		Cattle population (x 1000)	
	Total	Under program	Total	Under program	Total	Under Program
Argentina	2,779,892	2,779,892	295,897	295,897	46,883.0	46,883.0
Bolivia/1	1,098,581	250,650	98,139	8,900	5,819.1	530.0
Brazil	8,511,965	3,113,648	2,004,500	1,319,684	130,456.0	89,596.0
Colombia	1,141,748	846,154	502,185 /2	449,525	23,971.2	23,801.4
Chile	757,820	757,820	189,044	189,044	3,371.1	3,371.1
Ecuador	267,000	267,000	247,855	247,855	3,884.1	3,884.1
Paraguay	406,752	406,752	108,557	108,557	7,780.0	7,780.0
Peru	1,282,120	1,282,120	463,182	463,182	3,392.9	3,392.9
Uruguay	160,737	160,737	57,000	57,000	10,408.0	10,408.0
Venezuela	911,930	911,930	105,735	105,735	10,832.0	10,832.0
Total	17,318,545	10,776,703	4,072,094	3,245,379	246,797.4	200,478.5

Notes: /1 BOL - Figures pertain to program coverage in part of the departaments of Cochabamba and Santa Cruz.
/2 COL - Does not include figure from Vaupés.

TABLE 26. FMD vaccination. Number of animals vaccinated.
South America, 1988.

Country	Systematic vaccination					Strategical-tactical vaccinations		
	Cattle (x 1000)			Sheep / Goats				
	3 doses	2 doses	One dose	Nº of Animals (x 1000)	Fraction of dose	Cattle	Swine	Sheep/ /Goats
Argentina	42,640	1,370	1,265	17,304	3 cc	109,000	7,000	1
Bolivia	-	34	148 /1	-	-	27,145	-	-
Brazil /2	...	...	...	...	...	...	3,285	4,126
Colombia /3	...	...	5.5	-	-	1,213,179	...	-
Ecuador /4	...	...	75.6	-	-	-	-	-
Paraguay	3,699	275	1,062	-	-	140	2,000	-
Peru	-	-	-	-	-	88,020	-	-
Uruguay	9,332	54 /5	74 /6	-	-	-	-	...
Venezuela /7	...	...	...	-	-	...	...	...

Notes:
/1 BOL - Includes 20,000 animals from the area of Border Agreement Bolivia-Peru.
/2 BRA - The country reported that in the last stage of vaccination, 51,707,566 cattles were vaccinated.
/3 COL - The country reported the application of 13,322,172 doses in which figures of table are included.
/4 ECU - The country reported the application of 1,019,239 doses in which figures of table are included.
/5 URU - Cattle less than two years of age vaccinated with oil vaccine in the 2nd stage of vaccination.
/6 URU - Includes cattle less that two years vaccinated with oil vaccine.
/7 VEN - Due to the way vaccination registers were done in this case, figures could not be adapted to this table. Venezuela reported that until November 1988, 6,766,325 doses of the 10,154,900 doses distributed were applied.

TABLE 27. Production, control, international commercialization and availability of FMD vaccine (doses x 1000) by country. South America, 1988.

Country	Type of vaccine	Produced	Controlled	Approved	Exported	Imported	Available
Argentina	Oily	9,816.0	9,816.0	7,551.0	0.0	0.0	7,551.0
	Hidroxisap.	115,402.0	115,402.0	109,452.0	0.0	0.0	109,452.0
	Total	125,218.0	125,218.0	117,003.0	0.0	0.0	117,003.0
Bolivia	Oily	0.0	0.0	0.0	0.0	200.0	200.0
	Hidroxisap.	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.0	0.0	200.0	200.0
Brazil	Oily	35,066.9	35,066.9	30,658.3	1,000.0	0.0	29,658.3
	Hidroxisap.	246,739.0	246,739.0	198,767.8	0.0	0.0	198,767.8
	Total	281,805.9	281,805.9	229,426.1	1,000.0	0.0	228,426.1
Colombia	Oily	2,446.5	1,680.7	1,680.7	0.0	7.0	1,687.7
	Hidroxisap.	23,375.5	24,400.4	21,447.1	0.0	0.0	21,447.1 /1
	Total	25,822.0	26,081.1	23,127.8	0.0	7.0	23,134.8
Chile	Oily	0.0	0.0	0.0	0.0	0.0	535.0 /2
	Hidroxisap.	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.0	0.0	0.0	535.0
Ecuador	Oily	0.0	0.0	0.0	0.0	600.0	600.0
	Hidroxisap.	420.0	420.0	420.0	0.0	0.0	420.0
	Total	420.0	420.0	420.0	0.0	600.0	1,020.0
Paraguay	Oily	1,229.0	1,229.0	1,229.0	20.1	1,204.9	2,412.9
	Hidroxisap.	11,201.5	11,201.5	11,201.5	560.6	0.0	11,140.9 /3
	Total	12,430.5	12,430.5	12,430.5	580.7	1,204.9	13,553.8
Peru	Oily	0.0	0.0	0.0	0.0	55.0	55.0
	Hidroxisap.	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.0	0.0	55.0	55.0
Uruguay	Oily	0.0	0.0	0.0	0.0	150.0	150.0
	Hidroxisap.	45,088.9	45,088.9	36,588.1	380.8	0.0	36,207.3
	Total	45,088.9	45,088.9	36,588.1	380.8	150.0	36,357.3
Venezuela	Oily	1,244.0	244.0	244.0	0.0	4,300.0	4,552.8 /4
	Hidroxisap.	6,354.9	6,354.9	6,354.9	0.0	0.0	6,704.9 /5
	Total	7,598.9	6,598.9	6,598.9	0.0	4,300.0	11,257.7
Total	Oily	49,802.4	48,036.6	41,363.0	1,020.1	6,516.9	47,402.7
	Hidroxisap.	448,581.8	449,606.7	384,231.4	941.4	0.0	384,140.0
	Total	498,384.2	497,643.3	425,594.4	1,961.5	6,516.9	431,542.7

Notes: /1 COL - Also pending the results of 1,953,340 doses submitted to control.
/2 CHI - 485,000 doses of oil monovalent O1 vaccine produced by PAFMDC not used during the emergency presented in Chile during 1987. In COSALFA Reported of 1987 this figure was erroneously reported as 500,000. Also includes 50,000 doses stored at the Center for emergency situations.
/3 PAR - Includes 500,000 doses stored by the distributors at the time of the inquiry.
/4 VEN - Includes 8,750 doses not used in 1987, and 244,000 doses approved only for pigs.
/5 VEN - Includes 350,000 doses not used in 1987.

TABLE 28. Human resources inventory. Foot-and-mouth disease program. South America, 1987-1988.

Country	1987				1988			
	Total	Central	Laboratory	Field	Total	Central	Laboratory	Field
Argentina	1,686	35	148	1,503	1,638	34	147	1,457
Bolivia	159	58	45	56	143	26	72	45
Brazil	...	...	...	...	7,738	...	301	...
Colombia	893	71	182	640	886 /1	54	16	816
Chile	81	2	2	77	179	5	3	171
Ecuador	345	42	11	292	345 /2	42	...	303
Paraguay	559	157	84	318	556	150	85	321
Peru	518	5	8	505	520	2	...	518
Uruguay	580	69	106	405	535	69	61	405
Venezuela /1	402	17	...	385	385 /2	15	...	370
Total	5,223	456	586	4,181	12,925	397	685	4,406

Notes: a/ In some countries, personnel do not work exclusively in FMD Programs.
/1 COL - Does not include 146 personnel of Diagnostic Service, as follows: 42 professionales, 47 technical assistants and 55 administrative clerk that work 10% of the time for FMD program. Does not include those PRN personnel that work 50% of the time for Animal Health. Include personnel of Colombia-Ecuador Agreement an quarantine station Barranquilla.
/2 ECU,VEN - Laboratory Personnel is included in the total of field units.
... No information.

TABLE 29. Foot-and-mouth disease control program resources. South America, 1988. /a

Country	Operating units in the field	Human resources					
		Professionals			Others		
		Central	Laborat.	Field	Central	Laborat.	Field
Argentina	333	12	57	314	22	90	1,143
Bolivia	15	6	19	27	20	26	45
Brazil	957	...	58	1,808 /1	...	243	5,629 /1
Colombia /2	111	16	7	168	38	9	648
Chile	54	3	1	51	2	2	120
Ecuador	52	15	...	79 /3	27	...	224 /3
Paraguay	47	37	42	65	113	43	256
Peru	135	1	...	92	1	...	426
Uruguay	41 /4	21	13	65	48	48	340
Venezuela	150	11	...	166	4	...	204
Total	1,895	122	197	2,835	275	461	9,035

Notes: a/ In some countries, personnel do not work eclusively in FMD Programs.
/1 BRA - Includes central personnel.
/2 COL - Does not include 146 personnel of Diagnostic Service, as follows: 42 professionales, 47 technical assistants and 55 administrative clerk that work 10% of the time for FMD program. Does not include those PRN personnel that work 50% of the time for Animal Health. Include personnel of Colombia-Ecuador Agreement an quarantine station Barranquilla.
/3 ECU - Includes laboratory personnel.
/4 URU - Figure taken from country's report to COSALFA, 1987.
... No information.

TABLE 30. Vehicle inventories. FMD control programs. South America, 1987-1988.

Country	1987				1988			
	Total Area Km²	Total	Auto.	Moto.	Total Area Km²	Total	Auto.	Moto.
Argentina	2,779,892	1,152	1,152	-	2,779,892	1,267	1,267	-
Bolivia	250,650	26	...	...	250,650	25	24	1
Brazil	3,086,645	...	...	...	3,113,648	1,393	1,377	16
Colombia /1	686,743	360 /2	150	210	846,154	374	162	212
Chile	757,820	12	12	-	757,820	23	23	-
Ecuador	267,000	51	51	-	267,000	51	-	51
Paraguay	406,752	78	44	34	406,752	91	47	44
Peru	1,282,120	145	27	118	1,282,120	220	56	164
Uruguay	162,500	158	86	72	162,500	168	96	72
Venezuela	911,930	314	314	-	911,930	314	314	...
Total	10,592,052	2,296	1,836	434	10,778,466	3,926	3,366	560

Notes: /1 COL - Central unit and laboratory are in same building.
/2 COL - Includes 16 mobile units and 2 trucks.
... No information.

TABLE 31. Private and public expending (000 Us$). FMD program. South America, 1987-1988.

Country	Total	Public expending			Private
		Operative	Capital	Total	
Argentina	...	...	...	...	...
Bolivia	276.9	228.9	0.0	228.9	48.0
Brazil	6,594.3	2,179.1	4,415.2	6,594.3	...
Colombia	11,244.5	4,970.7	430.7	5,401.4	5,843.1
Chile	447.2	394.3	52.9	447.2	-
Ecuador	555.8	541.5	14.3	555.8	...
Paraguay	1,850.0	1,200.0	650.0	3,561.9	...
Peru	...	...	...	...	...
Uruguay	...	...	...	...	...
Venezuela	3,769.0	683.3	-	683.3	3,085.7
Total	24,734.7	10,187.8	5,563.1	15,760.9	8,976.8

Notes: ... No information.

TABLE 32. Cattle, meat, milk and semen imports. South America, 1988.

Importing country	Country of origin	Number of cattle	Semen (doses)	Embryos	Meat (m.t.)	Milk (m.t.)
Argentina /1	BRAZIL	1	-	-	-	-
	CANADA	5	6,000	-	-	-
	CHILE	10	-	-	-	-
	USA	32	-	-	-	-
	PARAGUAY	4	-	-	-	-
	URUGUAY	1,388	320,000	-	-	-
Bolivia	ARGENTINA, BRAZIL, PERU, URUGUAY	4,146	-	-	-	-
Brazil /2	ARGENTINA	40	-	-	-	-
	AUSTRALIA	-	...	-	-	-
	BOLIVIA	4,000	-	-	-	-
	CANADA	365	...	-	-	-
	USA	479	...	...	-	-
	FRANCE	-	...	...	-	-
	UNITED KINGDOM	-	...	-	-	-
	ITALY	-	...	-	-	-
	NEW ZEALAND	-	...	-	-	-
	PARAGUAY	3,000	-	-	-	-
	SWITZERLAND	-	...	-	-	-
	URUGUAY	1,279	-	-	-	-
Colombia /3	USA, CANADA, GERMANY, CHILE, COSTA RICA	2,488	-	-	-	-
	USA, CANADA, BELGIUM	-	201,285	-	-	-
	NETHERLANDS, BELGIUM, FRANCE	-	-	-	-	5,773.0
	ARUBA, CURAÇAO, PERU, VENEZUELA	-	-	-	2,770.2	-
	USA, GERMANY, CANADA	-	-	283	-	-
Chile /3	FED. REP. GERMANY	-	2,000	-	-	410.0
	WEST GERMANY	-	-	300	-	-
	ARGENTINA	-	-	-	1,303.0	5,202.6
	BELGIUM	-	-	-	-	1,937.2
	CANADA	-	29,337	-	-	23.4
	CZECHOSLOVAKIA	-	-	-	-	14.5
	DENMARK	-	500	-	-	-
	USA	-	-	-	7.6	1,230.0
	SPAIN	-	-	-	-	200.0
	FRANCE	-	-	-	-	650.0
	NETHERLANDS	-	-	-	-	819.0
	UNITED KINGDOM	-	-	-	-	800.0
	NUEVA ZALANDIA	-	4,600	-	-	3,265.8
	PARAGUAY	-	-	-	1,256.0	-
	SWEDEN	-	-	-	-	150.0
	SWITZERLAND	-	-	-	-	159.0
	URUGUAY	-	-	-	80.9	1,000.0
Ecuador	CANADA	8	1,860	-	-	-
	COLOMBIA	10	-	-	-	-
	USA	25	40,270	-	-	-
	FRANCE	-	134,000	-	-	-
Paraguay	GERMANY	-	3,450	10	-	-
	ARGENTINA	12	-	-	-	-
	BRAZIL	90	-	-	-	-
	USA	30	17,075	795	-	-
	FRANCE	-	1,420	-	-	-
	URUGUAY	516	-	-	-	-

TABLE 32. (cont'd).

Importing country	Country of origin	Number of cattle	Semen (doses)	Embryos	Meat (m.t.)	Milk (m.t.)
Peru	GERMANY	180	...	-	-	-
	ARGENTINA	3,900	-	-	-	-
	BRAZIL	11,970	-	-	-	-
	CANADA	2,018	14,020	-	-	-
	CHILE	400	-	-	-	-
	COLOMBIA	48	-	-	-	-
	CUBA	10,934	-	-	-	-
	ECUADOR	12	-	-	-	-
	USA	11,237	85,400	-	-	-
	SPAIN	90	-	-	-	-
	NETHERLANDS	1,200	-	-	-	-
	MEXICO	30	-	-	-	-
	NEW ZEALAND	4,355	-	-	-	-
	PANAMA	1,455	-	-	-	-
	URUGUAY	3,250	-	-	-	-
Uruguay	CANADA	3	9,365	-	-	-
	USA	1	13,620	-	-	-
	UNITED KINGDOM	-	220	-	-	-
Venezuela	AUSTRALIA	2,230	1,200	-	-	-
	CANADA	12,429	8,000	-	-	-
	CUBA	1,875	-	-	-	-
	COSTA RICA	3,615	-	-	-	-
	COLOMBIA	37	-	-	40.0	-
	DENMARK	-	-	-	2,040.2	20,331.2
	USA	6,163	468,353	1,000	-	-
	FRANCE	-	-	..	-	10,461.7
	NETHERLANDS	-	-	-	-	18,526.6
	UNITED KINGDOM	-	29,000	1,050	-	1,952.8
	IRELAND	-	-	-	3,879.3	8,806.7
	NEW ZEALAND	11,610	-	-	-	32,847.1

Notes: /1 ARG - The country reported importation pf 300 embryos from Germany, but did not imform the specie.
/2 BRA - Data subject to revision.
/3 COL,CHI - Preliminary data.

TABLE 33. Swine imports. South America, 1988.

Importing country	Country of origin	Number of pigs	Semen (doses)	Meat (m.t.)
Argentina /1	-	-	-	-
Bolivia	USA	-	1,000 /2	-
Brazil	USA, UNITED KINGDOM, GERMANY, DENMARK	-	...	-
Colombia /3	USA	30	-	-
Chile /3	CANADA	-	-	31.00
	USA	113	-	42.70
	SWEDEN	-	-	62.90
Ecuador	-	-	-	-
Paraguay	BRAZIL	30	-	-
Peru	FED. REP. GERMANY	120	...	-
	CANADA	565	-	-
	COLOMBIA	450	-	-
	CUBA	1448	-	-
	DENMARK	6	-	-
	USA	26	-	-
Uruguay	-	-	-	-
Venezuela	-	-	-	-

Notes: /1 ARG - The country reported importation pf 300 embryos from Germany, but did not imform the specie.
/2 BOL - In ampoules.
/3 COL,CHI - Preliminary data.

TABLE 34. Sheep imports. South America, 1988.

Importing country	Country of origin	Number of sheep	Semen (doses)	Meat (m.t.)	Milk (m.t.)
Argentina /1	AUSTRALIA	27	-	-	-
	NEW ZEALAND	7	1,000	-	-
	PERU	6	-	-	-
	URUGUAY	56	-	-	-
Bolivia	-	-	-	-	-
Brazil	ARGENTINA	105	-	-	-
	AUSTRALIA	1	-	-	-
	USA	193	-	-	-
	FRANCE	27	-	-	-
	NEW ZEALAND	114	-	-	-
	URUGUAY	2	-	-	-
Colombia /2	ARUBA, CURAÇAO, PERU, VENEZUELA	-	-	186.90	-
Chile /2	AUSTRALIA	4	-	-	-
	NEW ZEALAND	-	512	-	-
Ecuador	-	-	-	-	-
Paraguay	URUGUAY	161	-	-	-
Peru	GERMANY	6	-	-	-
	ARGENTINA	55	-	-	-
	AUSTRALIA	4	-	-	-
	CUBA	6800	-	-	-
	ISRAEL	17	-	-	-
	NEW ZEALAND	9500	-	-	-
	PANAMA	1100	-	-	-
	URUGUAY	18030	-	-	-
Uruguay	-	-	-	-	-
Venezuela	AUSTRALIA	30	-	-	-

Notes: /1 ARG - The country reported importation of 300 embryos from Germany, but did not inform the specie.
/2 COL,CHI - Preliminary data.

TABLE 35. Goats imports. South America, 1988.

Importing country	Country of origin	Number of goats	Semen (doses)	Meat (m.t.)	Milk (m.t.)
Argentina /1	-	-	-	-	-
Bolivia	-	-	-	-	-
Brazil	FRANCE	195	-	-	-
	UNITED KINGDOM	16	-	-	-
	SWITZERLAND	23	-	-	-
			-		
Colombia /2	USA, FRANCE	117	-	-	-
	USA	-	1,000	-	-
Chile /2	-	-	-	-	-
Ecuador	-	-	-	-	-
Paraguay	BRAZIL	7	-	-	-
	CHILE	10	-	-	-
Peru	-	-	-	-	-
Uruguay	-	-	-	-	-
Venezuela	-	-	-	-	-

Notes: /1 ARG - The country reported importation of 300 embryos from Germany, but did not imform the specie.
/2 COL,CHI - Preliminary data.

TABLE 36. Horses imports. South America, 1988.

Importing country	Country of origin	Number of horses	Semen (doses)	Embryos
Argentina /1	BELGIUM	23	-	-
	BRAZIL	10	-	-
	CHILE	10	-	-
	USA	75	190,000	48
	FRANCE	16	-	-
	PARAGUAY	3	-	-
	PERU	1	-	-
	URUGUAY	687	-	-
Bolivia	GERMANY, PARAGUAY	687	-	-
Brazil	GERMANY	25	-	...
	ARGENTINA	173	-	-
	BELGIUM	11	-	-
	CHILE	33	-	-
	USA	272	-	-
	FRANCE	8	-	...
	UNITED KINGDOM	8	-	-
	NETHERLANDS	6	-	-
	POLAND	4	-	-
	PORTUGAL	7	-	-
	SWEDEN	1	-	-
	SWITZERLAND	5	-	-
	URUGUAY	25	-	-
Colombia /2	USA, ECUADOR,		-	-
	PORTUGAL, CHILE,		-	-
	ARGENTINA	161	-	-
Chile /2	ARGENTINA	78	-	-
	BRAZIL	6	-	-
	USA	13	56,015	-
	NETHERLANDS	6	-	-
	UNITED KINGDOM	5	21,700	-
	ITALY	3	-	-
	PERU	9	-	-
Ecuador	ARGENTINA	23	-	-
	CHILE	1	-	-
	USA	16	-	-

TABLE 36. (Cont'd).

Importing country	Country of origin	Number of horses	Semen (doses)	Embryos
Ecuador	IRELAND	2	-	-
	URUGUAY	2	-	-
Paraguay	GERMANY	5	-	-
	ARGENTINA	842	-	-
	BRAZIL	56	-	-
	USA	71	-	-
	URUGUAY	790	-	-
Peru	USA	23	-	-
	ARGENTINA	205	-	-
	CHILE	15	-	-
	CANADA	6	-	-
	ECUADOR	100	-	-
	DENMARK	2	-	-
Uruguay	SPAIN	1	-	-
	FRANCE	1	-	-
Venezuela	GERMANY	2	-	-
	ARGENTINA	37	-	-
	CANADA	3	-	-
	CHILE	25	-	-
	COLOMBIA	4	-	-
	COSTA RICA	4	-	-

Notes: /1 ARG - The country reported importation of 300 embryos from Germany, but did not imform the specie.
/2 COL,CHI - Preliminary data.

TABLE 37. Cattle, meat, milk and semen exports. South America, 1988.

Exporting country	Importing origin	Number of cattle	Semen (doses)	Meat (m.t.)	Milk (m.t.)
Argentina /1	BRAZIL	26	-	-	-
	CHILE	276	-	-	-
	EEC	-	-	94,600.0	-
	HONG KONG	-	-	4,600.0	-
	CANARIAS ISLANDS	-	-	2,700.0	-
	MALTA	-	-	1,500.0	-
	ISRAEL	-	-	8,600.0	-
	PERU	520	-	-	-
	SWITZERLAND			3,300.0	-
	URUGUAY	32	-	-	-
Bolivia	...	...	...	...	...
Brazil /2	GERMANY	-	-	15,869.7	-
	ANGOLA	-	-	9,453.4	-
	SAUDI ARABIA	-	-	8,647.7	-
	ARGELIA	-	-	2,291.4	-
	BELGIUM	-	-	246.8	-
	CANADA	-	-	3,046.3	-
	SINGAPORE	-	-	3,021.6	-
	USA	-	-	24,594.5	-
	EGYPT	-	-	11,597.7	-
	SPAIN	-	-	7,525.9	-
	FRANCE	-	-	5,044.5	-
	HONG KONG	-	-	8,506.4	-
	UNITED KINGDOM	-	-	64,530.3	-
	IRAN	-	-	15,432.1	-
	IRAQ	-	-	47,293.4	-
	ISRAEL	-	-	16,524.4	-
	ITALY	-	-	18,224.2	-
	JAMAICA	-	-	3,618.3	-
	JAPAN	-	-	326.6	-
	NETHERLASNDS	-	-	13,005.7	-
	PUERTO RICO	-	-	3,611.3	-
	SWITZERLAND	-	-	4,300.3	-
	OTHERS COUNTRY	-	-	10,896.0	-
Colombia /3	VENEZUELA	39	-	-	-
	ARUBA, CURAÇAO, PERU, VENZUELA	-	-	2,770.2	-
Chile /3	BOLIVIA	8	-	-	119.1
	COLOMBIA	23	-	-	-
	PANAMA	-	-	-	3.5
	PERU	120	-	-	-
	SWEDEN	-	-	-	4.6

TABLE 37. (Cont'd).

Exporting country	Importing origin	Number of cattle	Semen (doses)	Meat (m.t.)	Milk (m.t.)
Ecuador	...	...	...	...	...
Paraguay /4	SAUDI ARABIA	-	-	2,501.1	-
	ARGENTINA	4	-	-	-
	BARBADOS	-	-	29.4	-
	BELGIUM	-	-	1.0	-
	BOLIVIA	-	-	1.3	-
	BRAZIL	14	-	5,381.8	-
	CANADA	-	-	0.001	-
	CHILE	-	-	1,601.6	-
	IVORY COAST	-	-	80.0	-
	DUBAI	-	-	39.0	-
	EAPAÑA	-	-	154.4	-
	EGYPT	-	-	3,416.7	-
	FRANCE	-	-	7.6	-
	GABON	-	-	19.3	-
	NETHERLANDS	-	-	285.9	-
	UNITED KINGDOM	-	-	703.6	-
	CANARIAS ISLANDS	-	-	744.7	-
	ITALY	-	-	105.4	-
	PERU	-	-	1,124.5	-
	MARITIME SUPPLY	-	-	88.5	-
	SWITZERLAND	-	-	39.3	-
	TRINIDAD AND TOBAGO	-	-	84.1	-
	URUGUAY	-	-	0.02	-
Peru	-	-	-	-	-
Uruguay	FED. REP. GERMANY	-	-	3,219.0	-
	ANTIGUA AND DEPEND.	-	-	17.0	-
	NETHERLAND ANTILLES	-	-	17.0	-
	SAUDI ARABIA	-	-	3,979.0	5.0
	ARGENTINA	360	38000	-	60.0
	BAHAMAS	-	-	50.0	-
	BARBADOS	-	-	283.0	-
	BELGIUM-LUXEMBURG	-	-	247.0	-
	BOLIVIA	464	-	-	-
	BRAZIL	2303		11,630.0	4.0
	CHILE	-	-	179.0	-
	CHIPRE	-	-	31.0	-
	COLOMBIA	-	-	-	153.0
	CONGO	-	-	48.0	-
	IVORY COAST	-	-	39.0	-
	CUBA	-	-	-	2,000.0
	DOMINICA	-	-	17.0	-

TABLE 37. (Cont'd).

Exporting country	Importing origin	Number of cattle	Semen (doses)	Meat (m.t.)	Milk (m.t.)
Uruguay	USA	-	-	1,836.0	-
	EGYPT	-	-	10,297.0	-
	EMIR. UNUT ARABIA	-	-	60.0	-
	SPAIN	-	-	112.0	-
	FRANCE	-	-	1,508.0	-
	GABON	-	-	901.0	-
	GREECE	-	-	569.0	-
	HONG KONG	-	-	1,576.0	-
	UNITED KINGDOM	-	-	9,466.0	-
	IRAQ	-	-	6,289.0	-
	IRAN	-	-	6,177.0	5,250.0
	CAYMAN ISLANDS	-	-	19.0	-
	CANARIAS ISLANDS	-	-	1,261.0	-
	ISRAEL	-	-	13,812.0	-
	ITALY	-	-	1,704.0	-
	JAMAICA	-	-	226.0	-
	JAPAN	-	-	11.0	-
	JORDAN	-	-	84.0	-
	KUWAIT	-	-	36.0	5.0
	MALTA	-	-	202.0	-
	MEXICO	-	-	-	5,367.0
	NETHERLANDS	-	-	2,470.0	-
	PARAGUAY	563	-	-	-
	PERU	-	-	16.0	-
	MARITIME SUPPLY	-	-	722.0	-
	PUERTO RICO	-	-	167.0	-
	SAN CRISTOBAL	-	-	17.0	-
	SINGAPORE	-	-	654.0	-
	SOUTH AFRICA	-	-	-	2.0
	SWITZERLAND	-	-	498.0	-
	TURKEY	-	-	279.0	-
	USSR	-	-	-	2,500.0
	VENEZUELA	-	-	-	20.0
Venezuela	-	-	-	-	-

Note: /1 ARG - The country did not inform the origin species of meat imports. It was presumed that it were mainly cattle.
/2 BRA - Preliminary data. The country did not imform the number of head exported.
/3 COL,CHI - Preliminary data.
/4 PAR - Products and by-products included.

TABLE 38. Swine exports. South America, 1988.

Exporting country	Importing country	Number of pigs	Meat (m.t.)
Argentina	BOLIVIA	40	-
	URUGUAY	3	-
Bolivia	...	...	...
Brazil /1	...	...	...
Colombia /1	-	-	-
Chile /1	Bolivia	12	-
Ecuador	...	...	...
Paraguay	-	-	-
Peru	-	-	-
Uruguay	-	-	-
Venezuela	-	-	-

Notes: /1 BRA,COL,CHI - Preliminary data.

TABLE 39. Sheep exports. South America, 1988.

Exporting country	Importing country	Number of sheep	Semen (doses)	Meat (m.t.)
Argentina /1	BOLIVIA	520	-	-
	BRAZIL	202	-	-
	URUGUAY	-	200	-
Bolivia	...	...	-	...
			-	
Brazil /2	...	...	-	...
			-	
Colombia /2	ARUBA, CURAÇAO, PERU, VENEZUELA	-	-	186.9
Chile /2	FED. REP. GERMANY	-	-	49.9
	SAUDI ARABIA	-	-	633.9
	ARGENTINA	-	-	559.0
	SPAIN	-	-	1,164.0
	FRANCE	-	-	84.8
	NETHERLANDS	-	-	724.9
	UNITED KINGDOM	-	-	404.2
	IRAQ	-	-	965.8
	ITALY	-	-	504.4
	JORDAN	-	-	167.8
	LIBYA	-	-	522.0
	PERU	-	-	117.0
Ecuador	...	...	-	...
			-	
Paraguay	-	-	-	-
			-	
Peru	-	-	-	-
			-	
Uruguay	GERMANY	1,433	-	375.0
	SAUDI ARABIA	-	-	-
	ARGENTINA	11,507	-	89.0
	BARBADOS	-	-	4.0
	BRAZIL	9	-	110.0
	CONGO	-	-	10.0
	IVORY COAST	-	-	90.0
	GABON	-	-	169.0
	IRAQ	-	-	5,377.0
Uruguay	JORDAN	-	-	253.0
	LIBYA	256,997	-	-
	PARAGUAY	390	-	-
	PERU	4,811	-	-
	MARITIME SUPPY	-	-	139.0
			-	
Venezuela	-	-	-	-

Notes: /1 ARG - From January to November 1988.
/2 BRA,COL,CHI - Preliminary data.

TABLE 40. Horses exports. South America, 1988.

Exporting country	Importing country	Number of horses	Meat (m.t.)
Argentina	GERMANY	108	-
	BOLIVIA	149	-
	BRAZIL	194	1,300.0
	CHILE	246	1,200.0
	USA	853	-
	UNITED KINGDOM	288	-
	ITALY	3379	-
	MEXICO	20	-
	PERU	110	500.0
	URUGUAY	311	-
Bolivia	...	...	...
Brazil /1	...	...	...
Colombia /1	USA, ECUADOR, PANAMA, DOMINICAN REP.	113	-
Chile /1	ARGENTINA	9	-
	BOLIVIA	19	-
	BRAZIL	28	-
	COLOMBIA	11	-
	ECUADOR	1	-
	USA	46	-
	SPAIN	6	-
	FRANCE	4	-
	UNITED KINGDOM	5	-
	VENEZUELA	20	-
Ecuador	...	...	...
Paraguay	ARGENTINA	2	-
	BRAZIL	27	-
	URUGUAY	4	-
Peru	ARGENTINA	1	-
	BRAZIL	2	-
	CHILE	13	-
	ECUADOR	13	-
	USA	16	-
	GUATEMALA	1	-
	PANAMA	1	-
	URUGUAY	1	-
	VENEZUELA	4	-
Uruguay	BRAZIL	41	-
	CHILE	4	-
	ECUADOR	2	-
	USA	4	-
	SPAIN	32	-
	ITALY	269	-
	PARAGUAY	723	-
Venezuela	-		-

Note: /1 BRA,COL,CHI - Preliminary data.

TABLE 41. Continental information and Epidemiological Surveillance System for Vesicular Diseases in Cattler. Reception level and delays in trasmitting weekly reports of outbreaks by map grid squares. South America, 1988.

Country	Weekly reports				Days of delays /c								
	Received		Published /a		Until receipt /b			Receipt-publication			Total /d		
	No.	%	No.	%	Md	Mx	Mn	Md	Mx	Mn	Md	Mx	Mn
Argentina	51	98	49	94	20	54	10	4	11	-	24	59	14
Bolivia	52	100	44	85	12	63	-	3	7	-	14	31	7
Brazil	52	100	50	96	10	19	6	4	68	-	14	78	10
Colombia	52	100	52	100	6	13	4	2	7	-	7	17	7
Ecuador	52	100	50	96	7	54	5	1	11	-	10	24	7
Paraguay	52	100	51	98	5	33	3	3	7	-	7	35	7
Peru	45	87	15	29	67	137	10	3	11	2	42	63	14
Uruguay	51	98	50	96	5	54	3	3	7	-	7	28	6
Venezuela	51	98	50	96	5	13	3	2	11	-	7	18	6

Notes: /a - Number of weekly reports published in proportion to those received.
/b -Time between last day of week covered by report and its receipt by PAFMDC.
/c - Md = Median; Mx = Maximum; Mn = Minimum. All time lengths are in days.
/d - Median times calculated between deadline date of week reported and publication of report.

TABLE 42. Continental Information and Epidemiological Surveillance System for Vesicular Disease in Cattle. Level of reception and publication of monthly reports on affected herds and diagnosis, by countries. South America, 1988.

Country	No. received	No. published	Months not received
Argentina	11	11	1
Bolivia	10	10	2
Brazil	12	12	-
Colombia	12	12	-
Ecuador	12	12	-
Paraguay	12	12	-
Peru	10	10	2
Uruguay	11	11	1
Venezuela	7	7	5

TABLE 43. Continental Information and Epidemiological Surveillance System for Vesicular Disease in Cattle. Delays (days) in receipt of monthly reports. South America, 1988.

Country	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Median
Argentina	39	10	40	10	24	19	60	29	41	79	49	...	39
Bolivia	57	28	56	26	43	13	58	...	...	35	76	45	44
Brazil	47	31	34	34	31	60	46	90	61	52	81	50	49
Colombia	29	23	25	23	28	22	29	37	34	29	29	30	29
Ecuador	26	37	36	23	24	35	40	36	39	35	46	29	36
Paraguay	26	98	67	37	31	33	58	33	45	42	53	46	44
Peru	115	86	55	53	22	209	178	147	117	86	...	...	101
Uruguay	74	45	42	39	38	14	2	8	4	56	28	...	38
Venezuela	113	84	53	136	105	75	44	...	...	...	...	...	84
Median	47	37	42	34	31	33	46	36	41	47	49	45	

Notes: ... Not received.

TABLE 44. Epidemiological surveillance activities: Indicator of laboratory confirmation of establishments affected by vesicular diseases. South America, 1988.

Country	Establishments affected			Percentage		
	Total	Sampled	W/positive diagnosis	With sampled	W/positive diagnosis	Sample w/ positive diagnosis
Argentina	365	256	135	70	37	53
Bolivia	65	26	17	40	26	65
Brazil	1,255	356	206	28	16	58
Colombia	1,577	1,104	855	70	54	77
Ecuador	97	42	21	43	22	50
Paraguay	3	3	2	100	67	67
Peru	68	23	14	34	21	61
Uruguay	10	10	8	100	80	80
Venezuela	228	91	43	40	19	47
Total	3,668	1,911	1,301	52	35	68

TABLE 45. Continental information and Epidemiological Surveillance System for Vesicular Diseases in Cattle. Reception level and delays in trasmitting weekly reports of outbreaks by map grid squares. Central America and Mexico, 1988.

Country	Weekly reports				Days of delays /c								
	Received		Published /a		Until receipt /b			Receipt-publication			Total /d		
	No.	%	No.	%	Md	Mx	Mn	Md	Mx	Mn	Md	Mx	Mn
Belize	-	-	-	-	-	-	-	-	-	-	-	-	-
Costa Rica	52	100	25	48	34	90	12	4	10	2	24	45	14
El Salvador	51	98	42	81	20	69	4	4	7	1	22	45	7
Guatemala	52	100	27	52	40	82	7	3	8	-	30	56	7
Honduras	-	-	-	-	-	-	-	-	-	-	-	-	-
Mexico	51	98	41	79	12	73	5	3	123	-	14	129	7
Nicaragua	23	44	15	29	20	102	4	3	7	3	16	30	7
Panama	52	100	45	86	20	42	6	3	11	-	21	45	7

Notes:
/a - Number of weekly reports published in proportion to those received.
/b -Time between last day of week covered by report and its receipt by PAFMDC.
/c - Md = Median; Mx = Maximum; Mn = Minimum. All time lengths are in days.
/d - Median times calculated between deadline date of week reported and publication of report.

TABLE 46. Continental Information and Epidemiological Surveillance System for Vesicular Disease in Cattle. Level of reception and publication of monthly reports on affected herds and diagnosis, by countries. Central America and Mexico, 1988.

Country	No. received	No. published	Months not received
Belize	12	12	-
Costa Rica	12	12	-
El Salvador	12	12	-
Guatemala	12	12	-
Honduras	12	12	-
Mexico	10	10	2
Nicaragua	12	12	-
Panama	12	12	-

TABLE 47. Continental Information and Epidemiological Surveillance System for Vesicular Disease in Cattle. Delays (days) in receipt of monthly reports. Central America and Mexico, 1988.

Country	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Median
Belize	19	30	48	26	16	27	32	112	60	29	21	45	30
Costa Rica	19	30	48	26	16	27	32	112	60	29	21	45	30
El Salvador	19	30	48	26	16	27	32	112	60	29	21	45	30
Guatemala	19	30	42	26	16	27	32	112	60	29	21	45	30
Honduras	19	30	48	26	16	27	32	112	60	29	21	45	30
Mexico	32	38	46	93	62	32	19	22	66	35	...	...	37
Nicaragua	19	30	48	26	16	27	32	112	60	29	21	45	30
Panama	19	30	25	26	16	27	32	112	60	29	21	45	30
Median	19	30	48	26	16	27	32	112	60	29	21	45	

Notes: ... Not received.