

Pan American Health Organization
ADVISORY COMMITTEE ON MEDICAL RESEARCH
Seventh Meeting
Washington, D. C., 24-28 June 1968
Item 6 of the Agenda

SCIENTIFIC ADVISORY COMMITTEE FOR
THE PAN AMERICAN ZOONOSES AND FOOT
AND MOUTH DISEASE CENTERS

Report of the First Meeting

Ref: STS/VS 1/3
30 November 1967

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD Health Organization

Washington, D.C.

**PAN AMERICAN HEALTH
ORGANIZATION**

**SCIENTIFIC ADVISORY COMMITTEE FOR
THE PAN AMERICAN ZOOSES AND FOOT
AND MOUTH DISEASE CENTERS**

**FIRST MEETING
20-25 November 1967**

**RAMOS MEJA, BUENOS AIRES
RIO DE JANEIRO, BRAZIL**

REPORT TO THE DIRECTOR

**Ref: STS/VS 1/3
30 November 1967**

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
WASHINGTON, D.C.

PAHO SCIENTIFIC ADVISORY COMMITTEE FOR
THE PAN AMERICAN ZOOSES AND FOOT AND MOUTH DISEASE CENTERS

Dr. Otto Bier
Professor
Escola Paulista de Medicina
Departamento de Microbiologia e
Immunologia
São Paulo, S.P., Brasil

Dr. J. B. Brooksby (.)
Director
The Animal Virus Research Institute
Pirbright, Woking
Surrey, England

Dr. J. J. Callis
Director
Plum Island Animal Disease Laboratory
U. S. Agricultural Research Service
Greenport, L.I., New York

Dr. Sandford S. Elberg(*)
Dean of the Graduate Division
University of California
Berkeley, California

Dr. Karl Habel
Scripps Research Institute
San Diego, California

Dr. Abraham Horwitz
Director
Pan American Health Organization
Washington, D.C.

Dr. Hilary Koprowski (Rapporteur)
Director, The Wistar Institute
Philadelphia, Pennsylvania

Dr. Stewart H. Madin (Chairman)
Director
Naval Biological Laboratory
Oakland, California

Dr. Manuel Moro Somo, Director
Instituto Veterinario e Investiga-
ciones de Enfermedades Tropicales
y de Altura
Facultad de Medicina Veterinaria
Universidad Nacional Mayor de San
Marcos
Lima, Perú

Dr. Ramón Rodríguez T. (.)
Decano, Facultad de Ciencias Pecua-
rias y Medicina Veterinaria
Universidad de Chile
Santiago, Chile

Dr. James H. Steele
Chief, Veterinary Public Health Unit
Communicable Disease Center
U.S. Public Health Service
Atlanta, Georgia

Dr. Calvin W. Schwabe (*)
Chairman, Department of Preventive
Medicine and Public Health
School of Veterinary Medicine
University of California
Davis, California

SECRETARIAT

Dr. Martin Kaplan
Chief, Veterinary Public Health
World Health Organization
Geneva, Switzerland

Dr. Pedro N. Acha
Regional Veterinary Advisor
Pan American Health Organization
Washington, D.C.

(*) Attended the first meeting September 19-29, 1967

(.) Unable to attend

Table of Contents

| | <u>Page</u> |
|--|-------------|
| PAHO Scientific Advisory Committee for the Pan American Zoonoses Center - Introduction | 1 |
| 1. Personnel | 2 |
| 1.1 Permanent staff | 2 |
| 1.2 Visitors and Trainees | 2 |
| 2. Physical facilities | 3 |
| 3. International Zoonoses Education | 3 |
| 4. Grants | 3 |
| 5. Rabies Program | 3 |
| 5.1 Vaccine production | 3 |
| 5.2 Evaluation of bovine vaccines | 4 |
| 5.3 Rabies accidents in man following vaccination | 4 |
| 5.4 New plaquing technique | 4 |
| 5.5 Other projects | 4 |
| 5.6 Limited specific new recommendations | 4 |
| 6. Brucellosis program | 5 |
| 6.1 Permanente technical service | 5 |
| 6.2 Field services | 5 |
| 6.3 Laboratory services of the Center | 5 |
| 6.4 Research project activities | 5 |
| 7. Hydatidosis program | 6 |
| 7.1 Drug studies | 6 |
| 7.2 Wildlife studies | 6 |
| 7.3 <u>In vivo</u> studies | 7 |
| 7.4 U.V. Radiation | 7 |
| 7.5 Immunofluorescence techniques | 7 |
| 7.6 Antigens studies | 7 |

| | <u>Page</u> |
|---|-------------|
| 8. Tuberculosis program | 7 |
| 8.1 Regional meeting | 7 |
| 8.2 Laboratory and field services | 7 |
| 9. Field Services and Training | 8 |
| 9.1 Field Services | 8 |
| 9.2 Training | 9 |
| 10. Other matters | 9 |
| 10.1 Laboratory animal medicine program | 9 |
| 10.2 Manufacture of products | 10 |
| 10.3 Ecological studies of dogs | 10 |
| 10.4 Serum bank | 11 |
| 10.5 Food Hygiene | 11 |
| 10.6 Look into the future | 11 |
| PAHO Scientific Advisory Committee for the Pan American Foot-and-Mouth Disease Center - Introduction | 12 |
| 1. Personnel | 13 |
| 2. Training and Information | 14 |
| 3. Physical facilities | 14 |
| 4. Grants | 15 |
| 5. The hemispheric responsibilities of the Center | 15 |
| 6. Field studies and control | 15 |
| 6.1 Control | 16 |
| 6.2 Campaigns | 16 |
| 6.3 Training | 16 |
| 7. Laboratory Services | 17 |
| 7.1 Diagnosis and reference service | 17 |
| 7.2 Vaccines | 17 |
| 7.3 Carriers | 18 |
| 8. Other matters | 18 |

PAHO SCIENTIFIC ADVISORY COMMITTEE FOR THE PAN AMERICAN ZONOSSES CENTER

Report to the Director

1967

The Director opened the first meeting of the Scientific Advisory Committee for the Pan American Zoonoses Center by welcoming the Committee members, Drs. Otto Bier, Karl Habel, Hilary Koprowski, Stewart Madin, Manuel Moro and James Steele, and regretted the absence of Drs. J. Brooksby and Ramón Rodríguez.

Dr. Horwitz commented on the expanding programs and the greater responsibilities that the Pan American Health Organization and the World Health Organization are assuming, both as a result of decisions of their governing bodies and the initiatives of the staff. As a logical result of this expansion he stressed the need for sound and experienced advice on basic health care problems in the Americas. He said, "What we need to do is to present the problems as we understand them, proposing the solutions that we feel are better suited for each situation, and request advice before assaying methods and developing systems".

He pointed out that "The lack of proper application of available knowledge stemming from well tested experience is among the greatest weakness of Latin America today", and this is quite true when we think about the process of health and disease which justifies our prime interest in the zoonoses as a conceptual and practical approach to health care.

In practice, our attention is focused on the zoonoses which show high incidence in the Americas: brucellosis, bovine tuberculosis, hydatidosis, and rabies. These are the basis for the program of activities of the Pan American Zoonoses Center.

In order to serve the governments more efficiently and following the practice of the Pan American Health Organization, we have assembled this Scientific Advisory Committee in order to receive advice on periodical basis concerning the general and specific activities of the Center and particularly on the four above mentioned diseases which form the basis of the Center's present program.

These zoonoses are certainly very complex problems "per se", to which we should add their biological, social, and economic implications for Latin America. The time has come to give the Center an extended role in the region. We need your advice on this difficult task in the hope to be able to put it in practice, and to let you know periodically how each proposal and situation has evolved.

The Director commented on the agenda items and noted that they are the expression of what we have been trying to accomplish at the Zoonoses Center since 1959. He mentioned the strengthening of the Center through a substantial grant of the United Nations Development Program and the very generous contribution from the Government of Argentina which gives concrete possibilities to expand the basic activities, education and research. This is described in the eight documents presented to the Committee, as prepared by the Director of the Center and his staff.

Dr. Stewart Madin was appointed Chairman of the meeting and Dr. Hilary Koprowski, Rapporteur.

1. Personnel

1.1 Permanent staff

The Committee feels that the present personnel is adequate for the current program of the Center, provided that the existing vacancies be filled as soon as possible. However, the time may come in not too distant a future, when the present staff will be unable to cope adequately with the expanding activities of the Center and it is, therefore, recommended that plans be made for the future increase of the permanent staff. The Committee is of the opinion that progress of some of the current projects is hampered by lack of competent immunological advice and recommends that the vacant position of immunologist be filled as soon as possible.

1.2 Visitors and Trainees

The Committee recommends that outstanding specialists in their field should be invited to participate in the activities of the Center, for a stay preferably extended to one year.

Every effort should be made to establish contact between the Director and the Staff of the Center with university departments and faculties in various countries in Latin America, in order to recruit a limited number of bright young workers for training at the Center. It is strongly recommended that the Center carefully outline its scope of activities to the universities in order to recruit only those trainees who would be interested in such a program. The period of training should not be shorter than 2 years and all efforts should be made to maintain close contact between the Center and its past trainees, modeled on a plan used successfully by the National Communicable Disease Center of the United States Public Health Service.

2. Physical Facilities

The Committee feels that the Center has vastly improved its facilities by moving from Azul to Ramos Mejía. At present time the physical facilities seem to be reasonably adequate except for animal house facilities. Funds, therefore, should be sought for construction of new animal quarters. If a long range plan for expansion of present facilities is contemplated, it should be presented at a future meeting of the Committee.

3. International Zoonoses Education

A series of seminars on important issues for the Americas should be given at the Center both in Buenos Aires and by travelling groups of speakers giving short courses or seminars in the major cities of the Americas. In this way much insignificant data can be avoided for its true value and more accurate information disseminated.

4. Grants

The Scientific Advisory Committee could be used to review, for the Director of the Center, all applications for external research grants.

5. Rabies program

In the opinion of the Committee there are two important practical and immediate responsibilities of the Center in the field of rabies. These are the improvement in quality control of vaccine production and the evaluation of vaccines for use in cattle.

5.1 Vaccine production

The past efforts through training courses must be followed by continuous consultation in the national production laboratories to ensure the proper routine use of the methods taught. This means visits to the laboratories in individual countries for periods long enough to allow evaluation and guidance under the local conditions.

Since LEP vaccine currently represents the best method of specific rabies control in dogs the production and use of this product should be encouraged. In order to effectively carry out this aspect of quality control it is important that the rabies staff of the Center develop competence with this vaccine. This requires the training of Center personnel in a U.S. laboratory currently producing LEP vaccine.

Looking to the future in rabies vaccine production, the Center's staff should start becoming more familiar with rabies tissue culture techniques.

5.2 Evaluation of bovine vaccines

In view of the quantitative significance of vampire bat transmitted bovine rabies in Latin America the decision as to the best prophylactic bovine vaccine available should be determined as soon as possible. Current evaluation by the Center's staff based on antibody response and challenge experiments must be continued. The eventual goal is a long lasting immunity following a single dose no more than once a year. Once a decision is made small field trials will be required to assure safety and efficacy in various breeds and under varying field conditions before broad routine use.

5.3 Rabies accidents in man following vaccination

Beyond the two major areas of high priority there are several other immediate problems. First the PAHO should make it known to the health departments of participating countries that any evidence of accidental rabies being produced in vaccinated humans should be immediately reported to the Center. The Center staff should be prepared to quickly investigate such situations from an epidemiological and virological standpoint while information and materials are still available.

5.4 New plaquing technique

Secondly, in view of the continuing requirement for large numbers of serum antibody titrations in nearly all the projects being pursued by the Center it is economically important for the staff to develop the newly available rabies tissue culture plaque technique for such purposes. This should be done immediately to effect large savings in the cost of mice.

5.5 Other projects

The attitude of the Committee concerning a number of proposed limited research projects in the field of rabies, beyond the above, was that these should be determined by the interest and enthusiasm of the individual scientist. The amount of time and effort to be spent on these projects should be determined after they meet the high priority projects requirements, and their relative priority should take into consideration the existence of special local conditions for their solution. In this last category would be studies of vampire bat ecology and the possible carrier state in dogs.

5.6 Limited specific new recommendations would include:

5.6.1 Standardization of the technique of Fuenzalida vaccine inactivated by beta propiolactone.

5.6.2 Tests in humans as to whether there is any interference with the antigenicity of Fuenzalida vaccine when antirabies serum is also used.

5.6.3 Check on rabies diagnosis by local laboratories through the use of coded specimens submitted to the Center.

6. Brucellosis program

6.1 Permanent technical service. At the request of government organizations of various countries, technical advice through correspondence or through personal visits by members of the Center should be facilitated. In addition, information on control procedures and laboratory techniques should be disseminated.

6.2 Field services:

- a) Coordination of anti-Brucellosis activities between different countries.
- b) Promotion of surveys on animal and human brucellosis in Latin American countries.
- c) Promotion on pilot area programs on goat brucellosis control.

6.3 Laboratory services of the Center should comprise:

- a) Maintenance and distribution of strains for Brucella antigens and vaccine production.
- b) Production and distribution of Brucella reference antigens.
- c) Quality reference services for B. abortus strain 19 vaccine and Brucella antigens.
- d) Typing at the Center of newly isolated strains in Latin America from human and animal origin. Distribution of reference strains, monospecific sera and phage preparations to various countries.

6.4 Research project activities.

After reviewing the research projects of the Center the following are recommended to be pursued:

6.4.1 The proposals to study caprine immunization. With a few minor modifications in the experimental design, the experiment should provide meaningful data for future guidance on animal health eradication. It is anticipated that this might start in the Fall, 1968, and supplies of dried vaccines can be obtained from Berkeley, California, as required.

6.4.2 The proposal to study calphered immunization by strain 19, in one month old animals, to be compared with six month old animals. Two years later, the surviving animals should be challenged. During the pre-challenge period, the range of serological tests which will be carried out is broad enough and should give much information on the kinds of antibody responses to strain 19 and/or to challenge strains. It is also very important to include in this study a determination of the effect of re-vaccination in animals immunized so early in life as 8-15 days and re-vaccinated at 3-6 months of age.

6.4.3 The survey of wildlife brucellosis in enzootic areas of Br. suis and melitensis may uncover some heretofore unrecognized reservoirs of infection. However, it is hoped that this study may continue without prejudice to the initiation of other studies on brucellosis.

6.4.4 Search for phages in Brucella cultures and animal and human excreta. Since the search for new and useful phages is relatively simple to do and can be arranged to suit the convenience of other projects, such studies for the detection of phages and their production for diagnostic use should be encouraged.

6.4.5 Detection of ram-epididymitis by serological procedures. This may be accomplished through the use of specifically-sensitized latex preparation. A spin-off from these studies will inevitably increase knowledge of the antigenic structure of Br. ovis. The advantages to such a test would be very great in the field.

6.4.6 It is further recommended to undertake the following research activities:

- a) Research on swine immunization
- b) Research on new products or inactivated non-agglutinogenic vaccines against bovine brucellosis.
- c) Research on diagnostic procedures to differentiate agglutination titers due to infection or vaccination.
- d) Studies on brucella antibodies during pregnancy.

7. Hydatidosis program

7.1 Drug studies.

Studies on drug for the treatment of canine echinococcosis should be continued since no reliance can be put on presently used drugs in the control of hydatidosis. However, it should be stressed that the use of drugs will be of limited value unless a satisfactory level of health education of dog owners is achieved which leads to a change in dog feeding practices and the avoidance of reinfection.

7.2 Wildlife studies.

Project on the incidence of hydatidosis in foxes and in the grison in southern South America has already been completed and was, therefore, not considered by the group.

7.3 In vivo studies.

Project on the evolution of taeniid eggs in the peritoneal cavity of Meriones unguiculata has merit and should be carried out as indicated. It has been suggested that other possibilities for in vivo observations should be tried, such as the granuloma pouch of Selye.

7.4 . V. Radiation

Project on the effect of U.V. radiation on the eggs of Echinococcus granulosus has merit and should be continued as outlined in the proposal.

7.5 Immunofluorescence techniques.

Project on the differentiation of taeniid eggs by immunofluorescence is new and has many technical difficulties, which were discussed. In particular, efforts must be made to avoid host antigens which may be attached to the eggs. It was suggested that eggs be washed in appropriate enzyme (such as trypsin) solutions to remove as much non-specific material as possible.

7.6 Antigens studies

The purification of specific antigen(s) from Echinococcus granulosus hydatid cyst fluid was discussed at length. The program as presented was considered sound. An alternate approach could be the filtration of the hydatid fluid through a column of a polymerized mixture of antibodies against host antigens. It is recommended that a member of Dr. Trejos' staff spend 3 months in 1968 at WHO Immunology Research and Training Center in São Paulo, working on this specific problem.

8. Tuberculosis program

8.1 Regional Meeting.

The Committee recommends the convening of a meeting in 1969 at the Center to discuss the control of tuberculosis as a first step. Promotional activities in the meantime should be carried out until the countries are ready and willing to make serious efforts at control and eradication. At the meeting, laboratory demonstrations of typing, tuberculin production and testing in guinea pigs and cattle; and discussions on avian, swine and bovine tuberculosis should be undertaken.

8.2 Laboratory and field services.

Following the above meeting, national programs on bovine tuberculosis eradication should be encouraged. In order to achieve this aim the following services should be provided by the center.

8.2.1 Establishment of a reference laboratory for mycobacteria at the Center.

8.2.2 If feasible, (see 10.2) establishment of a pilot tuberculin production plant for the following purposes:

- a) Training in production and standardization of tuberculins in different countries.
- b) To provide reference tuberculins to national laboratories.
- c) To provide tuberculin for special projects such as surveys on bovine tuberculosis in the different Latin American countries.

8.3 In addition, the establishment of uniformed procedures for registration of tuberculous lesions in slaughterhouses is recommended.

8.4 Other Projects. The S.A.C. feels that the following projects be undertaken:

8.4.1 Promotion of typing of mycobacteria from human patients.

8.4.2 Research on the etiology of non-specific sensitivity to mammalian tuberculin in Latin America.

8.4.3 Search for tubercle bacillii in tissues of tuberculous animals with localized lesions.

8.4.4 Determinations of the types of mycobacteria prevalent in swine, by random sampling at an abattoir.

8.4.5 Investigation on bovine strain tuberculin and human strain tuberculin for the diagnosis in animals.

9. Field Services and Training

Planning of the Field Service Activities of the Center should be integrated into the overall program of the Zoonoses Center. The proposals in the outline of activities which appear in the working document as presented to the S.A.C. form the basis for the Technical Services and Training Program.

9.1 Field Services

Activities in this category will consist principally of advisory services to the countries and will include:

9.1.2 Investigation. Control of outbreaks (epidemic aid). This applies to any zoonoses.

9.1.3 Stimulation of reporting, collection, and distribution of surveillance data.

9.1.4 Epidemiological investigations and animal population studies.

9.1.5 The application of recommended or standard techniques and procedures in diagnosis and control of the zoonoses.

9.1.6 Collaboration in the planning, evaluation and control programs, especially those that have international implications.

9.1.7 Assistance in the development of mathematical models for the projection of human and animal losses, and costs to the economy.

9.1.8 Assistance to the governments in obtaining necessary financial support, both national and foreign.

9.2 Training.

The Center has developed a reputation for training of professionals and technicians in the diagnosis, investigation and control of zoonoses. These activities should be intensified and expanded both within the Center and in the field, including travelling seminars. With the facilities and resources now available, assistance should be extended to the graduate schools of Public Health, Medicine and Veterinary Medicine (see 1.2).

It is recommended that, if feasible, plans be worked out to provide academic credit for long-term fellows.

It must be recognized that the training program should not exceed the resources of the Center and must be balanced with other activities of the Center. Efforts should be made to obtain additional financing for the training program from international agencies concerned with training.

The Center should look ahead to the opportunities of training young people who will become international public health workers. There are many students who have expressed interest in such activities. Support for such programs could be unilateral or multilateral. Such volunteers could receive training both at the Center or in the field.

10. Other matters

10.1 A laboratory animal medicine program for the Pan American Zoonoses Center.

The Pan American Zoonoses Center has the primary functions of service, research, and training with respect to zoonoses in Latin America. All of these functions require the use of laboratory animals to a greater or lesser degree. Therefore, for its own activities, the Center needs a sound program in laboratory animal care.

Secondly, the status of laboratory animal medicine and care in Latin America is not developed at the present time. The Center is the logical group to serve as the focal point for the laboratory animal needs for Latin America for the following reasons: 1) they recognize the needs for Latin America; 2) they have the support of the various countries involved; 3) they have (or will have) facilities; 4) they have trained personnel; 5) they have ongoing research and diagnostic programs necessary for training people in laboratory animal medicine and care; 6) they have the experience and support for training programs; 7) they have economic stability.

Essentially, the responsibilities of the Center in laboratory animal medicine would be: 1) to train professional and technical personnel; 2) to breed and supply nucleus colonies of special strains of laboratory animals for Latin America, providing resources are available; 3) to serve as a diagnostic center for laboratory animal diseases; 4) to continually upgrade professional and technical personnel through periodic short courses, seminars and the publication of information on laboratory animals.

In summary, satisfactory programs in research, diagnosis, and training cannot be performed without an adequate supply of normal laboratory animals. The development of a good program in laboratory animal medicine and care would seem to be a part of the function and responsibility of the Center and such a program would make the Center a leader in this field in Latin America.

10.2 Manufacture of products.

It has been recognized by previous committees, as well as by this one, that the production of all types of biological products at the individual national level represents a practical problem, especially from the standpoint of quality control. This could be circumvented in two ways. The first is that carried out in more developed countries through a broadly based commercial biological competence. The second would be to have a regional governmental organization take on this responsibility for the whole area. At the present time in Latin America neither of these is practical. However, S.A.C. feels that some kind of a compromise might be obtained through the use of selective contractual arrangements with those commercial biological houses presently in existence in Latin America and known to be competent. This should be accompanied by quality controls of the finished product by such organizations as the Zoonoses Center. The practical advantage of this suggested procedure would be to make individual arrangements for specific products of high priority involving special production problems.

10.3 Ecological studies of dogs.

The S.A.C. notes the scarcity of information on the population ecology of dogs in Latin America and the importance of this type of information in relation to public health problems such as hydatidosis, tuberculosis, rabies,

leptospirosis, toxoplasmosis and Chagas disease. It is suggested that the staff of the Center develop a research plan on dog ecology to be submitted as a grant application for subsequent review by S.A.C.

10.4 Serum bank.

Serum samples collected in connection with field research and surveillance activities should be preserved in a serum bank at the Center. Establishment of such a facility for long-term frozen storage of sera would soon provide a valuable addition to the research capabilities of the Center. To increase the value of the collection, precise epidemiological data must be recorded at the time each blood specimen is collected. Provision for use of electronic data processing equipment for storage and retrieval of epidemiological data, storage location and quantity and quality of sera will probably be required to permit maximum utilization of the serum collection.

10.5 Food Hygiene.

This subject deserves high priority as a PAZC activity. Training courses could well be planned for the next three years as soon as the post is filled. The major emphasis should be on microbiology, but chemical toxicology and food technology must also be covered. This unit should eventually develop into one of the major components of the Center.

10.6 Look into the future.

It has occurred to the Committee that in considering long range planning for the Center, more concern and emphasis should eventually be placed on the human public health aspects of the zoonoses.

The Committee feels that a balance between long and short-range programs of studies should be maintained. However, members of the staff should perhaps concentrate more on those long-range programs and projects which can be studied in depth, rather than on the short-term projects, which sometimes cannot be adequately investigated in the time allotted for their completion. Priority should also be given to projects which, because of the geographical location of the Center, cannot be studied successfully elsewhere.

PAHO SCIENTIFIC ADVISORY COMMITTEE FOR THE PAN AMERICAN FOOT-AND-MOUTH
DISEASE CENTER

Report to the Director

1967

The Director opened the meeting, welcoming Dr. Jerry Callis who joined the committee at this time. He emphasized the importance of the Foot and Mouth Disease Center as part of the Veterinary Services program of the Pan American Health Organization, and its key role in the inter-American efforts to control Foot and Mouth disease.

Dr. Horwitz informed the committee of the steps taken by the Organization in conjunction with the OAS in order to assure a stable and permanent financing of the Center, since the center will terminate as a project of the Technical Cooperation Program of the OAS by June 30, 1968. He stated that according to the resolutions passed by the Inter-American Economic and Social Council (Viña del Mar, Chile, June 1967), the Inter-American Committee of the Alliance for Progress, CIAP (Rio de Janeiro, Brazil, October 1967), and the Directing Council of PAHO (Port-of-Spain, Trinidad-Tobago, October 1967), the Pan American Foot and Mouth Disease Center will continue under the administration and technical supervision of PAHO; and, it will be financed through contributions from all the countries of the Americas following the scale of quotas established in the Pan American system.

He emphasized the economic importance of foot and mouth disease to the affected area of the continent, and the need for more and better information about the actual losses caused by this disease through operational research. This kind of information is particularly necessary for the countries who are free of the disease and whose economy would be greatly affected by introduction of FMD into their livestock. With our present knowledge, he said, it is premature to consider eradication feasible at this time; control is the recommended and most practical action to take now.

Dr. Horwitz spoke of the health implication of this disease, especially with regard to its effects in the reduction of the meat supply for human consumption. Our present statistics show that there is an excess of 750,000 children deaths per year due to many causes, but we know that better nutrition is a basic factor in the solution of this problem. This is one of the reasons our Organization is so interested in the Foot and Mouth Disease control activities.

The importance of this problem, he continued, has attracted the interest and participation of inter-national credit agencies, such as IDB, BIRF, AID, who have expressed their willingness to help finance the continental effort in the fight against this disease. In order to expedite the financing

and to guarantee the investment, guides have been prepared for the formulation of programs, and criteria for the evaluation of the same have been established. Three countries, Chile, Brazil and Paraguay have already submitted their loan requests for Foot and Mouth Disease campaigns to the Inter-American Bank. These credit agencies have requested that the Organization, through the Center, serve as the technical coordinating agency for the continental program.

The countries are counting upon this Center for advice and services to carry out their control activities, for research, for training, and the evaluation of their campaigns. For these reasons we need your support and advice in order to serve these countries better. This new financial situation for the Center also brings new responsibilities, and focuses the Center not only in its role as an institution for the betterment of animal health, but also as a need for the well-being of our people.

The committee also presented the following introductory remarks:

Foot and mouth disease is the most important animal disease of the Americas. In South America more than 300 million cattle, sheep, and swine which value exceeds \$30 billion, and earns almost \$ 1 billion annually in foreign markets are in peril. Unfortunately, because of FMD some of the major markets of the world are closed to South American meat, which if opened, would allow greater exports and income. North and Central America is free of FMD but is greatly concerned that the disease may be introduced accidentally at some future date and threaten the \$50 billion animal industry of that continent. The United States estimates that a large outbreak in that country would cost \$2 to \$3 billion to bring under control and eradicate, and if the epizootic persisted the costs could rise as high as \$15 billion. To protect the \$80 billion animal industry of the Americas there are only 2 research laboratories, at Plum Island, N.Y. and Rio de Janeiro, with the capability to deal with FMD epizootics and provide consultation and assistance to control the disease. The Center budget is slightly over \$1 million which is inadequate for the enormous responsibility assigned to it by the member Governments. There is an urgent need for all the countries of the Americas, concerned with FMD, to support the work of the Center in developing control programs.

1. Personnel

In view of the anticipated expansion of national and international control programs, through funds from International Credit Agencies, the Committee endorses the plans of the Center to increase the Staff of the Technical Assistance Section. This would include three Consultants to local Governments, one administrative Consultant, one person capable of analyzing and evaluating data forthcoming from the field, one person specialized in the production of inactivated virus vaccines, and one person who would, eventually, assume overall responsibility for quality control of

vaccine production. Since the expansion dictates an increase in personnel, it is imperative that funds from these sources be made available to the Center to fulfill this requirement.

The Committee recommends that a capable immunologist be added to the Staff as soon as possible because it is obvious that the immunological aspects of Foot and Mouth Disease are of paramount importance for the success of the program. In view of the preliminary success of the present program on modified live virus vaccine and its potential broader application, it is recommended that two additional virologists be added to the existing research staff of the Institute.

An increase in the professional staff has to be accompanied by corresponding new positions in the local supporting personnel including Office staff. Also, there is a need for an increase in personnel for training and information activities of the Center, and this requirement will be discussed under the Training and Information section.

2. Training and Information

The Committee recommends that, in view of the expanding national control programs, the training program of the Institute should consist of not less than one general training course per year supplemented by individual training programs for specialization in a given field. It is recommended that individual trainees spend no less than 6 months at the Center.

To increase the effectiveness of the training program the Committee recommends the hiring of a full-time technical training officer, a translator, and an audiovisual officer.

In order for these personnel to function efficiently new training materials have to be acquired.

3. Physical facilities

In view of the requirements for new buildings and land improvements, in order to make the present site of the Center operating at optimum efficiency, the Committee feels that it should raise the more basic question of relocating certain functions of the Center to a site nearer the city. The need for serious considerations of this problem is reinforced by the reduced working capacity of the personnel due to the time required in transportation to the present Center. Frequently necessary overtime, including weekend work, is precluded by this transportation difficulty.

The already recognized position of the Center as an International Training Resource in the general field of veterinary science could be better implemented at an in-town site, which is closer to the Academic Institutions.

The Committee recommends, however, that after certain functions of the Center are relocated, the present site be retained as a field station for large-animal experimentation and isolation facilities.

4. Grants

As stated in the Report on the Zoonoses Center in Argentina, the Committee members are willing to cooperate with the Director of the Center in reviewing all applications for external research grants.

5. The hemispheric responsibilities of the Center

The Committee urges the Center staff to give increased attention to those countries that are free from Foot-and-Mouth Disease, particularly, in their programs of prevention and control of vesicular diseases. This can be accomplished through courses and demonstrations in prevention techniques and individual consultations. The Committee wishes to encourage Governments, of all countries, to use the Center's advice and assistance in problems raised by the interchange of food and agricultural products having implications in the spread of vesicular diseases.

The Committee agrees with the views of the PAHO and Center's staff that there should be more coordination in the field of FMD control between all National and Regional Agencies involved in that area.

6. Field studies and control

The field studies of the Center are limited and should be expanded as soon as possible in order to provide a veterinary epidemiologist in each of the infected countries and ensure accurate reporting and develop surveillance programs which will be a prerequisite to control activities. The veterinary epidemiologists should be trained to collect and analyze data, in order to provide the necessary information needed by the national and international animal health authorities.

Epidemiology and biostatistics services at the Center must provide the necessary backup for the field epidemiologists. A simple data and retrieval system should be instituted as soon as possible. A veterinary epidemiologist geographer is needed to develop this aspect of disease investigation, record outbreaks and determine what geographical elements influence the spread and confinement of FMD. The possibility of research in geographical and temporal (space and time) relations in the prediction of FMD epizootics should be explored. Veterinary economics should also be included in all epidemiological studies so as to determine the monetary values involved. Mathematical models will be essential to calculate the present day and future costs to a country.

A computer specialist is needed to develop this phase of the Center's field activities. Accurate data as has been prepared in some Latin American countries, based on economic feasibility studies, will be needed to develop national programs, necessary budgets, and for loan requests to international credit agencies. The Center will need a trained economist who understands the veterinary, public health, and nutritional ramifications of FMD.

6.1 Control

The control of FMD is feasible in many countries with the development of improved vaccines in the Americas and Europe. The use of the new-improved vaccines in national programs is essential to the success of any campaign. To ensure the use of the new vaccines it is necessary to encourage their distribution and restrict the sale of useless vaccines. The Center should train laboratory personnel in the testing of vaccines to ensure uniformity and high standards (see 1.). In addition the Center should, in cooperation with the Governments, do at random tests to evaluate national testing programs. New information on the testing of vaccines should be distributed as special reports and be included in the monthly bulletin.

In many countries there is an urgent need for physical laboratory facilities to carry on routine testing of vaccines. The SAC urges that for FMD vaccines the national control laboratories be separate from the production laboratories, and be responsible for the testing of vaccines produced by both national and commercial laboratories.

The financing of the control and production of vaccine is a major problem in most countries of South America. In some countries commercial laboratories can assume this expenditure, while in others the national government will need external financing. The Center should help in ascertaining whether the financial needs are justified and can be supported.

6.2 Campaigns

National campaigns should have high priority in future activities of the Center. The development of these and Regional campaigns will require planning support from the Center as well as field personnel assigned to the respective countries. In addition, they will be able to guide the execution of field programs and assist in their evaluation. Field personnel should have a broad competency in epidemiology, economics, and health-education training.

6.3 Training

The training provided by the Center has been invaluable to the countries of South America, as well as Central America and the West Indies. The continuance and expansion of training fellowships for this is urged by the SAC, in addition, Center personnel should have the opportunity to obtain advanced training in epidemiology, statistics, economics, and observe new developments in control programs in other areas of the world.

The production of educational materials for the field training of local personnel such as films, slides, pamphlets, posters, and other items should be a continuing program of the Center. In addition, special seminars should be organized consisting of various groups of community leaders including bankers, businessmen, and communication specialists, including newspaper, radio and TV reporters.

It is essential that the FMD campaign have national and international coordination to assure necessary political, economical and scientific support.

7. Laboratory services

7.1 Diagnosis and Reference Service

It appears that the techniques now in use at the Center are adequate to handle the known diagnostic problems. There is ample evidence that the subtyping of materials from field outbreaks is useful and the results have been corroborated by the reference center at Pirbright. The immediate problem is how to better utilize the data that is being gathered on subtypes. It is suggested that the Center obtain an information retrieval system similar to those made by Royal McBee, or "Peek-A-Boo." Such a system might make data handling more expeditious, and form the basis to produce mathematical models to predict subtype changes.

Individuals from Latin American countries should be trained in serological diagnosis on an annual basis and such training should be appropriately budgeted.

The close cooperation which exists with the World Reference Laboratory for FMD at Pirbright is of paramount importance and should continue.

Diagnostic studies should be supplemented by acquiring additional staff and constructing a new facility in which to breed the required number of guinea pigs.

The use of the agar-gel technique for the diagnosis of FMD and VS should continue to be explored. Also, we strongly recommend that the quantitative C.F. micro-test for diagnosis be researched.

7.2 Vaccines

The staff is to be commended on the years of work on live virus vaccines and it is recommended that it be continued. Because of the experience now available to the Center on live-virus vaccines, the Center is in a good position to recommend criteria for such a vaccine. A group composed of the Center staff members should be asked to develop such standards.

It was suggested that in addition to those already underway the thermal gradient technique should be utilized to produce modified viral populations along with propagation of the virus in alien host cells. In this connection, it is suggested that the Center avail itself of cells in the American Type Culture Collection.

The Center is encouraged to continue work on inactivated porcine and ovine vaccines.

Cloned virus population should be used whenever possible in the live virus vaccine studies.

Vaccine potency testing techniques in laboratory animals should continue. Its usefulness is obvious.

7.3 Carriers

The Center is in a unique situation to continue investigation of this important subject. Its efforts would be implemented by a modern necropsy facility for large animals.

8. Other matters

8.1 The Committee recommended that for the second meeting of PAHO-SAC the documents prepared by the Centers for review and information of the Committee, should be distributed no later than the third week of August. It was also recommended that in order to allow the Committee to spend three full working days in each Center, the meeting should be extended from eight to ten days, from a Tuesday to a Thursday, using the weekend in between to travel from Buenos Aires to Rio de Janeiro.

8.2 It was decided that the second PAHO-SAC Meeting should take place either the first two weeks of October or the first two weeks of November. The secretariat will consult each member of the Committee to ascertain the most convenient date.