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MEETING OF THE WORKING GROUP ON THE PREVENTION, CONTROL, AND ERADICATION OF BRUCELLOSIS IN LATIN AMERICA AND THE CARIBBEAN

CONTENTS

1. Objective and Officers

In compliance with the mission and functions established in the agreement creating the Pan American Institute for Food Protection and Zoonoses (INPPAZ) of the Pan American Health Organization and in response to the request for technical cooperation on programs for the control and eradication of brucellosis contained in the resolution adopted by the VIII Inter-American Meeting, at the Ministerial Level, on Animal Health (RIMSA), the Meeting of the Working Group on the Prevention, Control, and Eradication of Brucellosis in Latin America and the Caribbean was held from 14 to 16 November 1994 at INPPAZ headquarters in Martínez, Argentina.

The objective of the meeting was to elicit, from a group of professionals from different countries and with a variety of experience, recommendations that should be taken into account in the formulation, execution, and evaluation of the national programs for the prevention, control, and eradication of brucellosis. These recommendations, moreover, should guide both the lines of technical cooperation and their implementation with a view to formulating and proposing a Regional Program for the Prevention, Control, and Eradication of Brucellosis.

To this end, 13 experts were gathered together, with the participation of authorities from the ministries of health and agriculture of the Argentine Republic, a representative from the Inter-American Institute for Cooperation on Agriculture, and, as observers, several specialists from public institutions in Argentina and officials and experts from PAHO/INPPAZ. The list of participants and observers is found in Annex A.

A working document on the rationale for a Regional Program for the Prevention, Control, and Eradication of Bovine Brucellosis in Latin America and the Caribbean, prepared by INPPAZ and distributed beforehand among the working group's participants, contributed to the analysis and discussion of the items on the agenda.

After the meeting was opened, the officers were designated: Dr. Leslie Garry Adams was elected Chairman of the meeting, Dr. Jorge Rodríguez Toledo, Vice Chairman, and Dr. Patricia Lopetegui, Rapporteur, with Dr. Raúl Londoño Escobar, Director of INPPAZ/PAHO-WHO, serving as Secretary ex officio. This was followed by the adoption of the agenda, found in Annex B.

Prof. Paul Nicoletti, of the University of Florida, sent his apologies for not attending the meeting, together with comments on both the importance of the document prepared by INPPAZ and the use of the strain 19 vaccine. Dr. Nicoletti expressed his desire to collaborate and share his experiences in brucellosis control.

Similarly, because he was unable to attend, Prof. Gerardt Schurig, of the Virginia Polytechnic Institute, underscored the value of the working document and sent his technical observations on the use of different vaccines and vaccination procedures and the need to use the ELISA test in the eradication programs.

Dr. Tania María de Paulo Lyra, Secretary of Agriculture and Livestock Protection of Brazil, who sent her apologies for not being able to attend the meeting, expressed the opinion that the working document was outdated and made some remarks about its applicability to Brazil. She stated that the brucellosis problem urgently demands a solution and cited some relevant aspects that should be considered when formulating the national programs for control, namely: the conditions in the different livestock areas and circuits; the participation and institutional and professional integration of the public and private sectors, together with their respective infrastructures; specific programs for the training and education of professional and auxiliary personnel in public health and animal health; the development of laboratories capable of providing diagnostic services as well as the production and control of the specific inputs.

1.1 *Presentations of 14 November*

The first presentation was by Dr. Jaime Estupiñán, who discussed the structure and strategy of PAHO technical cooperation in veterinary public health and animal health, emphasizing that the basis for regional cooperation programs are the programs carried out in the countries themselves and that cooperation is grounded in the organization and execution of the regional programs in close collaboration with the countries. This concept and the application of the operational approaches to cooperation utilized by the Organization will guide the formulation and execution of the Regional Program for the Prevention, Control, and Eradication of Brucellosis. These approaches are: the establishment of standards and norms, training, information dissemination, research, and direct technical assistance.

Dr. Estupiñán reported on the experiences of regional programs such as the eradication of foot-and-mouth disease, the elimination of rabies, the eradication of tuberculosis, and the regional program for technical cooperation in food protection. Furthermore, he noted, it should be borne in mind that PAHO is not a source of financial support and that the rationale for technical cooperation for control of brucellosis is its importance as a zoonosis and as an economic problem.

After debating the topic, it was concluded that PAHO acts in response to requests from the countries and the priority that they assign to the control of brucellosis; that PAHO will not be the source of financing for the programs; and that it is necessary to develop a regional program and draft a proposal for the implementation of technical cooperation.

The presentation of Dr. Raúl Casas Olascoaga analyzed the working document prepared by INPPAZ. This working document proposes the frame of reference for the prevention, control, and eradication of human and animal brucellosis. It describes the epidemiological situation and the current status of the national programs, presenting the objectives, criteria, and institutional and technical instruments needed for their organization, development, and reformulation. In addition, it describes the proposal for PAHO technical cooperation as well as the sanitary goals of the regional program for the next decade.

Dr. Casas emphasized that brucellosis is a serious public health problem involving several thousand human cases annually, particularly in Latin America. It is, moreover, a devastating disease for the production and productivity of animal species for food production, such as cattle, pigs, and goats. It affects the profitability of rural enterprise and family livestock production and has an adverse impact on the availability of essential nutritious food, jeopardizing the food security of the peoples of Latin American and the Caribbean, where many millions suffer from malnutrition.

The globalization of the economy and trade, fostered by the creation of large economic blocs, will demand greater competitiveness and higher quality products, supported by the harmonization of sanitary standards and quality control. In this regard, the programs to combat brucellosis are essential for the countries of the Region.

Dr. Casas stated that the program to combat brucellosis should focus fundamentally on the development of the national programs and on broad technical cooperation among the countries.

These sanitary programs require sustained efforts in the medium and long term, and it is essential to have the participation of the different groups that make up the agricultural and livestock sector: producers and small farmers; the meat and dairy industry; the agricultural and livestock product industry; the universities, liberal professionals linked to the agricultural and livestock sector, and society as a whole, together with the public sector in its role as regulator of the sanitary programs.

Dr. Casas pointed out that the INPPAZ Laboratory should be strengthened in order to provide reference in brucellosis and other zoonoses and to serve as liaison and support for the national reference laboratories and the scientific institutions and collaborating centers that cooperate in brucellosis.

He also noted that the contributions of this working group will be very useful in the preparation of a special report to be presented to the IX Inter-American Meeting, at the Ministerial Level, in Animal Health (IX RIMSA) in 1995.

During the presentation and in the discussions there was agreement that, in view of the experience of other regional programs under way that have had favorable outcomes, the proposal to create a regional program offers many advantages. He concluded that it is essential to establish guidelines for diagnosis, vaccines, epidemiological surveillance, and strategies, all of which should be based on the experiences of plans of eradication currently in execution. He also stated that the program must be based on solid technology, education, and the progressive implementation of the control activities, beginning with eradication at the level of the individual livestock producer, moving on to the departmental or provincial levels, and finally, the national level.

The working document should be strengthened with regard to the implementation of the strategic plans, the period of execution, and fiscal realities.

Dr. Eduardo Alvarez presented an epidemiological situation analysis of brucellosis in the Region and expounded on the variability of its prevalence in the Americas. He also discussed the gaps in knowledge about the situation in most of the countries. In addition, he reported on the results of a survey on the epidemiological situation and the programs in the Americas conducted by INPPAZ.

During his presentation, he divided the countries into three groups: those that are disease-free (13); those where brucellosis is suspected but not confirmed (7); and those known to be affected or in which the disease is endemic (19).

After the discussion, it was concluded that there is a clear need for training in epidemiology and for technical support to the countries for the collection and analysis of epidemiological information on brucellosis.

Since, generally speaking, the current strategies of the country programs for control of brucellosis have not been formally established, there is a need to develop and implement databases, information systems, and standardized registries.

Dr. Jorge Carlos Wallach introduced the medical topic of brucellosis in humans, demonstrating the importance of the disease in Argentina and pointing out deficiencies in case reporting.

He also discussed the development of research to differentiate individuals with active infections from those with past exposure who have recovered from the disease. After debating the topic, it was concluded that serological tests for diagnosing the infection in man should be conducted in the future.

It was concluded that there is a need to develop and standardize the national program components related to diagnosis, treatment, and education. The legal obligations and human suffering attributable to brucellosis should be utilized to illustrate the need for a major program to eliminate the disease in pigs, goats, and cattle. Likewise, in the area of food protection, concrete steps should be taken to ensure the safety of milk and cheeses as the principal sources of infection.

Dr. Patricia Lopetegui used the program for control of brucellosis of Chile to introduce the topic of the strategies and the technical rationale for the control and eradication of the disease. This program is solid in the control of bovine brucellosis but evidences limitations and frustrations in the control of the disease in pigs. During the debate, this situation led to an analysis of the feasibility of simultaneously implementing national programs for the control and eradication in all three species—cattle, pigs, and goats.

It was also emphasized during the debate that vaccination is really important in areas of high prevalence but should be linked with good management practices, restricting the movement of livestock, an adequate program of diagnosis, and the slaughter of positive reactors. The economic incentive policy should be analyzed in each country; this is also a complement to control.

Comments were made on the progress in diagnostic methods, which has not been reflected in the area of programming. Thus, the need for the epidemiologist to discuss the plan of action for control of the disease with the owner of each herd is plain, and a flexible and efficient plan for control in the affected properties is recommended.

It was also concluded that, due to the changes resulting from the privatization of veterinary services, the current structure of the services should be analyzed in each country, since the solution to control problems lies in the response of the veterinary or animal health services.

1.2 *Presentations of 15 November*

On resuming the activities, Dr. Judith Bosse introduced the topic of methods of laboratory and field diagnosis in animal species. Her presentation consisted of a review of most of the diagnostic tests available and discussed currents trends for selecting the most efficient tests for the diagnosis of bovine brucellosis. She pointed out that for a program of control and eradication, it is necessary to select a screening test and a confirmatory test. Her report included the recommendations on diagnostic tests issued by the Harmonization Group of the World Association of Veterinary Laboratory Diagnosticians.

After the dialogue and active intervention of the participants, the following aspects were emphasized:

During training activities, the criteria for utilizing the various diagnostic tests should be specified, based on their sensitivity, specificity, availability, and the existing prevalence.

In infected herds, chiefly where vaccination is practiced, bacteriological confirmation is essential, the purpose being to differentiate field strains involved from the vaccine strains.

The different concentrations of antigen utilized in the Bengal Rose plate test or the card test, depending on the European or American origin, and the lack of comparative results between the two makes this area a suitable topic for research. Of all the tests, it was agreed that the card test is one of the best screening tests. As confirmatory tests, the complement-fixation and tube agglutination tests are used. The ELISA test should be employed and adapted to the countries' conditions before being regularly incorporated.

There was also agreement on the need to define the proper concentration of antigen for the Bengal Rose plate test in goats.

The milk ring test was also judged a highly valuable tool for epidemiological surveillance. The technical details on diagnostic methods are found in the presentation of Dr. Bosse.

The topic of laboratory methodologies for diagnosis in humans was introduced by Dr. Ahide Lopez Merino, who reported on the activities carried out in the laboratory of Mexico's national program. During the debate, the need to standardize the diagnostic antigen became clear, in addition to the need to harmonize serological procedures, cultures, and reporting. Another aspect deemed important is the selection of rapid detection methods to facilitate timely treatment.

The presentation of Dr. Leslie Garry Adams dealt with alternative procedures in the areas of control, vaccines, and vaccination. He reviewed the advantages and disadvantages of the strain 19, Rev. 1, and Suis S2 vaccines. He also analyzed the variables of sex, age, and dosage in terms of constraints and limitations on their usefulness. He concluded that strain 19 and Rev. 1 are highly effective and that new vaccines, created through the genetic engineering of rough brucella strains with a good immunization potential, should be investigated. He also recommended that calves under three months of age not be vaccinated with strain 19 and that the vaccination be done

only by trained professionals. At the same time, he cited the importance of progressively eliminating vaccination in areas in which it is not necessary.

Most of the debate centered on the vaccination of adult animals, the main agreement being that this be carried out under official supervision when special epidemiological conditions are present in infected herds.

It was also recommended that the new vaccines currently being developed against *Brucella abortus* be evaluated in Latin America.

Next, Dr. Martín Hugh-Jones made a presentation on hemispheric and national epidemiological surveillance of brucellosis in humans and animals. During his talk, he described the key elements of both the program for the control and eradication of animal brucellosis and the surveillance system utilized in the United States. He pointed to the need for a clear understanding of the problem in each country in order to establish realistic programs for control.

The discussion highlighted the need to strengthen human resources education, chiefly in the area of epidemiology and laboratory diagnosis, and to elicit the active participation of livestock producers in the implementation of the programs of control. In addition, it emphasized the need for basic data, such as the number of animals, location of the herds, identification of the livestock, control of their movements, speedy knowledge of test results, active recording, and analysis of the history of the herds and the individual animals within the herds, as well as a subregional analysis of them that will permit the adoption of specific strategies.

It was recommended that the programs for eradication start in the areas of lower prevalence and that epidemiological surveillance have a basic infrastructure as part of the program for control, noting that the surveillance should not be entrusted to the private sector.

Dr. Raúl Londoño introduced the topic of the regional reference system, emphasizing that it is comprised of the national systems of the countries, with similar functions. For proper operation of a regional reference center, a commission should be formed, made up of the responsible officials or focal points of the countries, who should meet at least once every two years. The regional reference center should produce reports that permit action in the countries, as well as regional evaluation and programs whose contents and frequencies have been defined, in addition to the coordination of international technical cooperation.

2. Recommendations

Meetings and discussions were held in three working groups, which issued recommendations on specific topics. The final report, which was analyzed, read, and approved at the plenary session, contains recommendations for a Regional Plan of Technical Cooperation:

2.1 *Regional Plan of Technical Cooperation*

- It is recommended that the document *Prevention, Control, and Eradication of Brucellosis in Latin America and the Caribbean*, prepared by INPPAZ, serve as the frame of reference for the formulation of the national programs and a regional program of technical cooperation for the control and eradication of brucellosis.

- It is recommended that INPPAZ prepare a complementary document that takes into account the recommendations and observations issued by the technical group that met at INPPAZ on the technical components linked with the program components for the control and eradication of brucellosis. This document should include the technical concepts and criteria for the program components for the control and eradication of brucellosis but should be flexible, so that each technical component can be adapted to the situation of the countries and regions involved.

- Bearing in mind that brucellosis patterns are intimately linked with the predominant forms of production, the existing socioeconomic relations among these forms, and the impact that the current programs have had on the disease, an epidemiological characterization of the countries and areas where the programs of control and eradication are to be implemented should be performed, with a breakdown, at the very least, as follows: (a) disease-free areas; (b) areas where disease is suspected but not confirmed, or confirmed but contained by programs to less than 5% of the herds and less than 0.1% of the cattle in them; and (c) areas without organized programs and/or with more than 5% of the herds infected and/or more than 0.1% of positive reactors.

2.2 *Strategies and Alternatives for Control*

- Within the overall strategies, it is recommended that economic cooperation among countries, collaborating centers, and scientific institutions be strengthened and developed in depth with regard to the mobilization of human, technical, economic, and financial resources, both domestic and external.

- It is recommended that the program in each country be structured on the basis of a situation analysis that describes the predominant ecosystems, applying country

strategies appropriate to the respective ecosystem. Based on these ecosystems, strategies, and lines of action for disease-free areas and enzootic areas with low, intermediate, and high prevalence will be developed.

- It is recommended that programs be organized on the basis of the guidelines found in the working document and the orientations of the technical group, including the different program components: diagnosis; epidemiological surveillance, vaccination, sanitation, identification of infected animals, systems of sanitary accreditation, education, training, legislation, research, control of mobilization, and emergency fund.

- It is recommended that the control be based on valid epidemiological measures of recognized efficiency, within a socially and economically viable framework.

- It should be borne in mind that these programs require sustained efforts in the medium and long term, and it is essential to have active participation in the sanitary programs by the different sectors that make up the agriculture and livestock bloc, namely: the public sector, producers, and small farmers; the private medical and veterinary professions; other professions and technicians linked to agriculture and livestock; the meat and dairy industries; manufacturing industry based on agricultural and livestock products; the local authorities; and society as a whole, which should be actively involved in the sanitary programs.

- Special attention should be paid to the upgrading of the veterinary services to boost their efficiency in the current economic situation, which is characterized by greater private sector participation.

- Program development requires a research component in the areas of economics, epidemiology, vaccine development, and diagnostic methods.

- Feasibility studies that allow for both public and private sector financing should also be incorporated into the programs.

2.3 ***Legislation and Regulations***

- Legislation and regulations should include the mandatory reporting of both the disease and abortions.

2.4 ***Epidemiological Surveillance***

- The Epidemiological Surveillance System should utilize a comprehensive approach that covers surveillance of the agent, monitoring of the host population, and

knowledge and follow-up of the socioeconomic evaluation of the environment in which these activities take place.

- The participation of producers and professionals from the private sector is fundamental in the design, implementation, operation, and evaluation of the Epidemiological Surveillance System.

- The Epidemiological Surveillance System should include mechanisms for information dissemination, training, and periodic evaluation at the national, regional, and local levels.

- Epidemiological surveillance in brucellosis requires that, at a minimum, the following be taken into account: (a) the basic unit of work is the herds and flocks; (b) standardized diagnostic methods must be available, in line with the Recommendations of the Symposium on the Harmonization of Diagnostic Methods held at INPPAZ Headquarters, during the VII Meeting of the World Association of Veterinary Diagnosticians (WAVLD); (c) it is necessary from the very beginning of the projects to have standardized systems for the identification of herds and flocks and for the identification of animals when the program enters the eradication phase; (d) up-to-date censuses of herds and animals are essential, as are viable, reliable, and effective procedures to control their movement, bearing in mind that this latter is a key factor in the transmission of the disease.

- Human resources must be trained at the different levels in which they work, and they must be continuously brought up to date through monitoring of the evolution of the disease. This requires adaptation of the surveillance instruments, especially diagnostic procedures.

2.5 ***Vaccines and Vaccination***

- The *Brucella abortus* vaccine, strain 19, is still the recommended vaccine for cattle, according to the standards in place. In the countries with an intermediate or high prevalence, the foundations of the program for control is the vaccination of calves from 3 to 8 months of age. In countries with organized programs where control is advanced, the use of a vaccine dosage of 3 - 10 x 10^9 is recommended, the optimal dosage being 5 x 10^9 viable cells.

- The vaccination of adult animals with lower dosages is a tool that can be employed under official supervision and control in programs with an epidemiological criterion and should be based on a plan for the herd in question prepared by the veterinarian, together with the owner of the livestock. The objective is to reduce infection and the spread of the disease; for this purpose, it

will be used in infected herds with a prevalence of over 10%, herds with episodes of abortion, and herds with persistent infection. The vaccine dosage for adult animals is 3 - 10 x 10^8, with 5 x 10^8 being the optimal dose.

- For goats, vaccine *B. melitensis* Rev. 1 is recommended.

- The strategy for porcine brucellosis remains the culling of infected herds and substituting positive reactors with replacement stock from disease-free herds.

- The evaluation of new vaccines, under experimental conditions, is recommended.

2.6 ***Diagnostic Procedures***

(a) For diagnosis in man, the following is recommended:

- The use of bacteriological diagnosis through hemoculture (it is recommended that six samples be drawn in a 48-hour period or, at the very least, three in 24 hours). The use of bone marrow is optional.

- That the samples be taken during the first month of the disease, to do the hemoculture for a maximum of three months. In patients with prior antibiotic therapy, it is recommended that a system to eliminate the antibiotics be utilized. (PAHO/INPPAZ utilizes Primatone for screening).

- Use of the Bengal Rose plate test as a screening test in serological diagnosis. For those who prefer the buffered acidic brucella antigen plate test (BAP), it is recommended that it be evaluated against the Bengal Rose plate test.

- Discontinuation of the Huddleson plate test for the diagnosis of human brucellosis.

- For use as complementary tests: the standard tube agglutination and the mercaptoethanol test (agglutination test in the presence of 2-mercaptoethanol).

- Evaluation and validation of the ELISA method for a better assessment of the chronic patient.

- The establishment of technical standards for the production and standardization of the reagents utilized in the diagnostic tests. Since there is no consensus with regard to the optimal cellular concentration of the antigens for use in humans, it is recommended that a study be proposed to determine the proper concentration. The standard should incorporate the concentration identified.

- Bring the diagnostic tests used in the various countries into line (in order to arrive at test equivalents).

(b) For diagnosis in animals, the following is recommended:

- Use of the Bengal Rose plate test or the acid buffered brucella antigen plate test (BAP) as screening tests.

- Complement and confirm with the tube agglutination test, the mercaptoethanol test, the rivanol test, and the complement-fixation (under refrigeration). Complement with culture to isolate *Brucella* in infected herds and flocks.

- Utilize the milk ring test for epidemiological surveillance in dairy herds.

- Evaluate and validate the ELISA test and competitive ELISA test selected for diagnostic use.

- Establish and/or strengthen the national reference centers, taking advantage of the country's existing scientific and technical resources for the establishment of these centers.

- Establish norms for the production and standardization of the reagents used for the diagnosis of animal brucellosis.

2.7 ***National Reference Laboratories***

It is recommended that the following responsibilities be established for the reference laboratory:

- To ensure the standardization of diagnostic reagents for all laboratories in the country and/or to facilitate access to the reagents and to maintain contact with the different sites for the production of biologicals.

- To validate tests in the country (*in situ*) and bring the proposed diagnostic methodologies developed into line with those of other countries.

- To validate new techniques developed within the country or in international laboratories.

- To educate personnel in the country, offering technical training courses or refresher courses.

- To monitor quality, through the provision of quality-assured samples for intra- and interlaboratory control.

- For laboratory control in each country, all of the above should be applied insofar as possible to humans and animals. INPPAZ should cooperate with the countries toward the creation of national diagnostic and reference centers.

2.8 ***Components of Technical Cooperation***

- Taking into account the experience of other regional programs, it is recommended that the international organizations promote and support the policy decision to develop sanitary programs for brucellosis control in the Region.

- The technical, economic, and financial cooperation of international organizations is recommended for the organization and execution of the regional and national programs.

- To establish collaboration between countries the creation of a National Reference Center is recommended; this Center would identify cooperation needs and strategies.

- It is recommended that INPPAZ, as the Regional Center, propose meetings of these centers in order to establish the cooperation strategies.

Technical cooperation among countries and on the part of international agencies is recommended as a priority toward:

- The establishment of the information and surveillance systems and the realization of studies characterizing the situations.

- Evaluation of the epidemiological surveillance systems.

- Harmonization of the procedures for data collection and analysis, as well as for automation, with a view to their utility for a regional database.

- Promotion and support of coordinated programs and projects in border areas between countries and regions with similar production and epidemiological characteristics.

- Training of professional and technical personnel in both the organization of the systems and analytical procedures, including their automation.

- Requesting support for INPPAZ in order to evaluate cooperative technical and scientific research projects related to the control and diagnosis of brucellosis, and to obtain funding.

- Provision of technical cooperation in order to create the national centers and establishing methodologies as expeditiously as possible.

- Development and implementation of accreditation systems for professionals and laboratories.

- Ensuring that the WHO Collaborating Centers in Brucellosis work with PAHO/INPPAZ and the countries toward the implementation of the Regional Program for the Control and Eradication of Brucellosis, especially in aspects related to the standardization of reagents, diagnostic methods, and monitoring of vaccines.

Annexes

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AGENDA

1. Justification

As an occupational disease, brucellosis is responsible for significantly lower performance levels among affected workers and increased absenteeism, especially among rural workers and workers in the industries that process or manufacture animal products and by-products. The population at large is also affected through the consumption of contaminated food, mainly raw or poorly pasteurized milk and fresh cheeses.

Although brucellosis is very widespread in Latin America and the Caribbean, with serious sanitary and economic consequences, the prevalence of the infection varies widely from region to region.

In most Latin American and Caribbean countries, there is underreporting of cases in humans, primarily because reporting is not mandatory and this disease is generally treated on an outpatient basis. In countries with mandatory reporting of this zoonosis, morbidity figures are high; for example, in Mexico, 6.9 per 100,000 population, and in Peru, 5.6 per 100,000 population.

In animals, this disease chiefly affects livestock: cattle, pigs, and goats. In cattle (*Brucella abortus*), the greatest prevalences are found in dairy cows, with values ranging from 0.1% to 20.3% in South America and from 0.02% to 2.3% in Central America. In infected countries, herds with reactor animals reach 20% or more.

In pigs (*Brucella suis*), the infection is confined to certain areas; however, this makes it possible to estimate the overall prevalence of positive reactors at from 0.5% to 2%, with rather marked variations, depending on the type of exploitation and the technology employed.

In goats, the presence of brucellosis (*Brucella melitensis*) is highly significant for public health, since it is the strain most pathogenic to man. In the Americas, this disease is focused in the northwest of Argentina, Mexico, Peru, and Venezuela, with a prevalence of positive reactors ranging from 2% to 10%.

The economic losses attributable to bovine brucellosis in the Americas are calculated at US$ 270 million annually. This figure in cattle is calculated on the basis of losses sustained in breeding production, milk production, and replacement costs; in Argentina, for example, these categories would represent 47%, 41%, and 12%, respectively, of the total losses from this disease.

In light of this situation, the countries of the region are making great efforts to control the disease in animals and thereby prevent infection in humans. Furthermore, at the VIII Inter-American Meeting, at the Ministerial Level, on Animal Health, held in April 1993, the ministers of agriculture discussed the topic with reference to the health of agricultural workers and the risks of zoonosis and occupational accidents linked with agriculture and livestock.

As a result of their discussions, they adopted Resolution IX, which in part 2, art. b and c, requests the countries to strengthen or establish national programs for zoonoses that affect agricultural workers and their families, and in part 4 requests the Director of PAHO to collaborate with the countries in the analysis and evaluation of different models for addressing these problems.

In response to the countries' request, PAHO, through the Veterinary Public Health Program and the Pan American Institute for Food Protection and Zoonoses (INPPAZ), is convening national experts in brucellosis in the present meeting for the purpose of discussing the prevention, control, and eradication of this disease in Latin America and the Caribbean.

2. Objective

To propose regional strategies and the technical rationale for the prevention, control, and eradication of brucellosis in the Americas.

3. Headquarters and Dates

Pan American Institute for Food Protection and Zoonoses
Talcahuano 1660, Martínez, Provincia de Buenos Aires, Republic of Argentina
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Domestic Fax: 793-0927
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Dates: 14-16 November 1994

4. Methodology

To achieve the meeting's objective, a prior review should be undertaken of scientific and technical advances in the prevention, control, and elimination of brucellosis and its epidemiological status in the Americas. For this purpose, a dynamic methodology will be used, such as brief presentations of predetermined topics.

These presentations will consist of a summary review (20 minutes) of scientific advances and the viable technical proposals to be applied in a program for the elimination of brucellosis, taking into account the current context of the livestock economy of the developing countries. Using this as a foundation, the group will begin a sharing of experiences that will lead, by consensus, to recommendations for regional technical cooperation strategies to be incorporated into a plan of action.

5. **Participants**

National experts in brucellosis from the following countries: Argentina, Brazil, Canada, Mexico, Peru, and the United States of America.

6. **Secretariat**

Pan American Health Organization:

- PAHO/WHO Program on Veterinary Public Health
- Pan American Institute for Food Protection and Zoonoses
- Pan American Foot-and-Mouth Disease Center

7. **Agenda**

14 November 1994

09:00 - 09:30: Opening of the Meeting

Remarks by Dr. Raúl Londoño, Director of INPPAZ/PAHO-WHO

Remarks by the Representative of the PAHO/WHO Coordination Office for Veterinary Public Health, Dr. Jaime Estupiñan

Remarks by the Representative of the Ministry of Public Health of Argentina, Dr. Carlos María Juliá, Director of Preventive Sanitary Medicine

Inaugural Remarks by Dr. Juan Carlos Manetti, as Representative of the General Administrator of the National Animal Health Service of Argentina, Dr. Bernardo Cané

09:30 - 09:45 Designation of Officers. Adoption of the Agenda

14 November 1994 (cont.)

09:45 - 10:00	*Coffee*
10:00 - 10:30	Structure and Strategies for PAHO/WHO Technical Cooperation in Veterinary Public Health Presentation: Dr. Jaime Estupiñán
10:30 - 11:00	Introduction to the Document *Program for the Prevention, Control, and Eradication of Brucellosis in Latin America and the Caribbean* Presentation: Dr. Raúl Casas Olascoaga
11:00 - 11:30	Analysis and Discussion
11:30 - 12:00	Epidemiological Status of Bovine Brucellosis in the Americas. Introduction to the topic Presentation: Dr. Eduardo Alvarez
12:00 - 12:30	Analysis and Discussion
12:30 - 14:00	*Recess*
14:00 - 14:20	Situation and Prevention of Brucellosis in Humans in Argentina Presentation and Moderator: Dr. Jorge Wallach
14:20 - 15:00	Analysis and Discussion
15:00 - 15:15	*Coffee*
15:15 - 15:35	Strategies against Brucellosis in the Different Animal Species. Introduction to the topic Presentation and Moderator: Dr. Patricia Lopetegui
15:35 - 17:30	Analysis and Discussion

15 November 1994

09:00 - 09:20	Methodologies for Laboratory and Field Diagnosis in Animal Species. Introduction to the topic Presentation: Dr. Judith Bossé Moderator: Dr. Boris Szyfres
09:20 - 09:40	Methodologies for Laboratory Diagnosis in Humans Presentation: Dr. Ahide López Merino Moderator: Dr. Boris Szyfres
09:40 - 10:15	Analysis and Discussion
10:15 - 10:30	*Coffee*
10:30 - 10:50	Alternative Control Procedures. Vaccines and Vaccination. Introduction to the topic Presentation: Dr. Leslie Garry Adams Moderator: Dr. Martín Hugh-Jones
10:50 - 12:30	Analysis and Discussion
12:30 - 14:00	*Recess - Luncheon*
14:00 - 14:20	Hemispheric and National Epidemiological Surveillance of Brucellosis in Humans and Animals. Introduction to the topic Presentation: Dr. Martín Hugh-Jones Moderator: Dr. Jorge Barozzi
14:20 - 15:00	Analysis and Discussion
15:00 - 15:15	*Coffee*
15:15 - 15:35	Regional Reference System. Introduction to the topic Presentation: Dr. Raúl Londoño
15:35 - 16:00	Analysis and Discussion

15 November 1994 (cont.)

16:00 - 17:30 Preparation of Recommendations and Final Report

16 November 1994

09:00 - 10:00 Preparation of Recommendations and Final Report

10:30 - 10:45 *Coffee*

10:45 - 12:00 Reading and Analysis of the Final Report

12:00 - 12:30 Closure