PANEL: ZOONOSES OF IMPORTANCE FOR THE ECONOMY AND FOR PUBLIC HEALTH

BRUCELLOSIS AND BOVINE TUBERCULOSIS: CONTROL OR ELIMINATION?

by

Javier Usabiaga
Secretary of Agriculture, Livestock, Rural Development, Fisheries, and Food.
Mexico
CONTENTS

1. Introduction ........................................................................................................... 3

2. Public Health ......................................................................................................... 3

3. Production ............................................................................................................... 4

4. Quality and Safety ................................................................................................. 5

5. National and International Trade .......................................................................... 5

6. Advantages of Elimination ..................................................................................... 5

7. Programs ................................................................................................................ 6
   7.1 Regulations and Standards ................................................................................. 6
   7.2 Participation of Governments ........................................................................... 6
   7.3 Participation of Producers ................................................................................ 6
   7.4 Participation of Veterinarians ........................................................................... 7
   7.5 Financing and Constraints .............................................................................. 7

8. Technical Aspects ................................................................................................ 8
   8.1 Brucellosis ......................................................................................................... 8
   8.2 Bovine Tuberculosis ........................................................................................ 11

9. Short- and Medium term Prospects ..................................................................... 14
   9.1 Eradication in Beef Cattle .............................................................................. 14
   9.2 Elimination of Bovine Tuberculosis and Brucellosis in Livestock for Dairy Production ................................................................. 15

10. Insurance ............................................................................................................... 15

11. Development of Operating and Financing Systems Involving Co-participation .... 16

12. Final considerations .............................................................................................. 16
1. Introduction

The modern world is witnessing the march toward globalization, which is taking us to the concept of “the global village.” It is important to understand that this process refers not only to trade but to the risk of promoting the worldwide spread of infectious diseases.

In today’s new world of total communication, we in government must be very alert to the risk that foreign diseases will be introduced into our countries. In the face of this challenge, our response capacity, our creativity, our intelligence, and our coordinated action will redound in immediate and effective responses to minimize the risk that these diseases will be introduced and the reduction and elimination of existing diseases.

Every day society is showing a greater concern about issues related to health, the environment, and animal well-being. Society demands that its food be inexpensive and safe. The people responsible for areas linked with animal health must assess the impact of their programs on the environment, public health, and society’s perceptions.

The globalization of markets has led to new demands in animal health, since for countries to be competitive in world markets, they must establish and maintain areas free of animal diseases, which will gradually lead to the definitive elimination of these diseases in every country.

All this necessitates the development of national livestock identification systems. International agreements require scientific information that will make it possible to verify the health status of animals and animal products in order to avoid and, if need be, settle possible claims. Budgetary constraints require new modalities of financing for animal health programs to ensure that the countries have the necessary capacity for diagnosis, epidemiological surveillance, sanitary campaigns, and the certification of food safety.

The organizers of this meeting have conferred on me the honor of making this presentation on the issues faced by the governments of the Region when deciding whether programs to combat to brucellosis and bovine tuberculosis should focus on control or eradication.

2. Public Health

Combating these diseases requires the commitment of those who primarily benefit, the organized producers, in addition to governments, given the importance of this issue for public health. Brucellosis in animals causes major harm, leading to a drop in production and a halt in genetic improvements because of the abortions that it causes. Furthermore, infected herds cannot be sold in international markets.
The importance of brucellosis as a zoonosis is clearly recognized, because every case in humans has its origin in direct contact with infected animals or indirect contact through the consumption of unpasteurized milk and dairy products, mainly fresh cheeses.

Brucellosis remains one of the most widespread zoonoses in the world. The disease in humans can be caused by several species of the same bacterial genus, capable of infecting different animal species. This makes it necessary to have comprehensive programs in place to combat the disease—not only in cattle, but in goats, sheep, and even pigs, when the disease is enzootic on pig farms.

Brucellosis is among the diseases found on List B of the International Office of Epizootics (IOE).

From the public health standpoint, the magnitude of bovine tuberculosis as a zoonosis is unknown (especially in Latin American countries), since information on this problem in the human population of each country is unavailable. According to studies conducted in the U.S. state of California, an estimated 7% of all tuberculosis cases in humans have their origin in cattle. The Government of Mexico is opening a new phase in the fight against this disease, in which it is committed to improving the animal health situation in partnership with producers. Thus, it is gearing policies in this area toward the solution of problems that reduce livestock productivity and undermine public health, as is the case of the two terrible diseases that concern us today. The harmonization of efforts in Mexico between the Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food (SAGARPA) and the Ministry of Health (SSA) to achieve synergy should break with the old patterns of divorce or indifference between the health and agriculture sectors. The use of economic stimuli as incentives to combat zoonoses requires the involvement of producers, industry, merchants, and other sectors in the effort. To this end, we must follow the recommendations of the International Office of Epizootics (IOE), the World Health Organization (WHO), the Pan American Health Organization (PAHO), and other international agencies working in animal and human health. Under this national and international system of standards, the priorities in animal health and public health are identified and the programs of work agreed upon.

3. Production

The mechanisms for producer participation in the struggle against bovine tuberculosis and brucellosis in Mexico have been strengthened with the formation of State Livestock Promotion and Protection Committees, civic groups that promote livestock productivity and establish the sanitary measures to protect against and combat diseases. The mechanisms for participation, moreover, include the financing of animal health campaigns through the “Rural Alliance” program, which allocates economic resources for programs to promote livestock production, and in phytozoosanitary matters, through a system for contributions of matching funds from the federal and state
governments and organized producers. Through regionalized planning, this program establishes actions first for the control and, subsequently, the elimination of bovine tuberculosis and brucellosis in areas of the country where these diseases are still endemic.

4. **Quality and Safety**

The current policy demands quality and safety in foods of animal origin. Products obtained from ruminants become scarce with the appearance of tuberculosis and brucellosis. This situation makes the two diseases very important and underscores to governments, producers, and industry the urgent need to implement control programs, followed by elimination programs.

In the immediate future, dairy products and meat that do not meet quality and safety standards will face serious constraints in terms of their marketing and consumption. Thus, governments must convince producers, industry, merchants, academia, and professionals to participate in the campaigns for the control and elimination of zoonoses.

5. **National and International Trade**

Markets are now incredibly sensitive to sanitary problems, and their reaction can be seen in the financial and agricultural area. We have made a commitment in our Region to turn our countries into models of health—where no door is closed because of sanitary problems. Each of our countries needs free access to the world markets. We must therefore strengthen our animal health programs, promoting adequate surveillance activities and undertaking with a real will every action that maintains and improves the animal health situation in our countries. If international markets are closed to us because of diseases in our livestock, our efforts to improve livestock productivity will account for little.

6. **Advantages of Elimination**

To address the question in the title of this presentation—that is, whether it is better to control or eliminate bovine tuberculosis and brucellosis—the immediate answer, based on common sense and the issues analyzed in this first chapter, is that elimination is the better path. However, our reality also indicates that this will be no easy task, since eliminating these diseases requires a major effort and considerable investment. Many of our countries will have difficulty meeting this goal. Hence, it will be necessary to put together regional strategies that will make control activities feasible in the more difficult areas or types of livestock production, i.e., where there is a higher prevalence of these diseases, as in dairy farms. In addition, elimination activities should be targeted to areas in which it is more advisable to slaughter the animals and indemnify producers, owing to the low prevalence of the diseases, as in livestock for meat production, which technically corresponds to the livestock sector where it is more feasible to slaughter reactive animals.
7. Programs

7.1 Regulations and Standards

Standardizing the control or elimination programs for bovine tuberculosis and brucellosis is indispensable for all the countries, since the resulting legal instruments will make it possible to undertake the activities in an organized manner and ensure compliance with the regulations. Most of the countries in the Hemisphere currently have standards in place to guide fieldwork—standards that contain the technical procedures necessary to control and eliminate the diseases in question.

The problem for many countries is that their regulatory instruments are no longer up to date since they do not cover the entire chain of production, and federal monitoring and verification of compliance with the standards by is limited for structural reasons. It is the governments' responsibility to bring their official standards for tuberculosis and brucellosis control and elimination up to date, taking advantage of the most recent technical information. This should be accomplished within the framework of geographical regionalization and differentiation of the needs between cattle raised for meat and for milk, without forgetting other species such as goats, the species principally responsible for public health problems linked with brucellosis.

7.2. Participation of Governments

Government participation in campaigns for the control or elimination of bovine tuberculosis and brucellosis has traditionally been very important in our countries, so much so that in recent years both the technical activities and the resources for meeting the objectives have flowed almost exclusively from the governments.

The past decade witnessed the birth of a serious movement to pare down federal governments, which has made it impossible to undertake unilateral campaigns. This has opened up participation in these campaigns to the private sectors linked with livestock production.

Today, country governments have devoted their efforts and resources to the coordination, supervision, and evaluation of the activities of these campaigns, without losing their steering role and their high responsibility in the processes.

7.3 Participation of Producers

In a joint effort with industry, since the late 1980s, livestock producers have intervened in a very significant way in the operations and financing of the campaigns against bovine tuberculosis and brucellosis. As a result, some nations like Mexico have made great strides in the production of beef cattle in strategic areas of the country.
The importance of producer participation in the campaigns is not limited to their operational and financial involvement. They must go far beyond that and become the principal promoters of these programs. This would result in significant benefits, with the possibility of exporting not only livestock on the hoof but products with value added.

For livestock used in milk production, the dairy industry encourages producers to keep their herds free of disease by paying a surcharge for milk of higher sanitary quality.

7.4 Participation of Veterinarians

Veterinarians play one of the most important roles in the programs for the control and elimination of bovine tuberculosis and brucellosis, due to their leadership in the coordination and execution of scientific and technical support to ensure the progress of the programs. Diagnosis, epidemiological analysis, inspection in slaughterhouses, monitoring programs, brucellosis vaccination programs, the imposing of quarantine, risk assessment, and other relevant aspects of the programs correspond to veterinarians. The countries must ensure that they have highly trained cadres of these professionals.

The past 10 years saw the start of the process for the accreditation, approval, or authorization of veterinarians in support of the official programs, significant among which are the campaigns that concern us. Here it should be pointed out that Mexico began this process in 1990 and currently has over 1,000 veterinarians providing significant assistance to the tuberculosis and brucellosis campaigns. The Federation of Schools and Associations of Veterinary Specialists coordinates the regulation of this process. The National Technical Advisory Council on Animal Health, made up of independent experts from academia, industry, and the private sector, the greatest percentage of whom are veterinarians, also plays a key role.

7.5 Financing and Constraints

There is no doubt that to control and eliminate bovine tuberculosis and brucellosis, adequate financing is needed for the technical activities requested by the programs and for defraying the costs implied by the elimination of infected animals. This becomes a serious constraint when countries do not have sufficient resources to eliminate a significant number of animals.

This situation must be addressed by the governments, in partnership with producers and industry, to ensure genuine co-participation in the efforts and allocation of resources by the entities involved. Alternative sources of financing must also be identified to ensure that sufficient resources are available to achieve steady progress in the programs.
8. Technical Aspects

8.1 Brucellosis

8.1.1 Brucellosis in Cattle in the Hemisphere

There are a little over 455 million head of cattle in the Hemisphere, the majority of which, 63%, are located in South American countries. North America accounts for 33%, and Central America and the Caribbean, the remaining 4%.

Epidemiological information on brucellosis in the Americas is generally poor, frequently due to inadequate reporting, or because of the biases produced by diagnostic studies directed to certain regions by constantly sampling the same herds.

The following countries of the Hemisphere have made significant progress in brucellosis control: Canada, Cuba, the Grenadines, Jamaica, United States of America, and Uruguay; these countries are practically free of brucellosis and account for approximately 25% of the cattle population of the Hemisphere. Their formula for success is broad vaccination coverage, consistency, and the participation of the various sectors.

The other nations in the Region have sanitary programs in place to combat this disease; however, their progress to date has been rather spotty. Some countries have national programs but do not cover all herds, which leads to the spread of the disease; other countries limit their programs to certain regions or types of livestock production.

8.1.2 Brucellosis Control and Eradication Programs

During the 1930s and 1950s numerous investigations were conducted worldwide, aimed at developing efficient, reliable, and economical techniques for diagnosing brucellosis in animals and humans. Also intensely investigated was the possibility of developing a vaccine to prevent the disease in animals. Since then, useful tools have become available for the control and eradication of this disease. With new diagnostic tests, infected animals in herds can be distinguished from vaccinated animals so that they can be slaughtered, or in certain situations, temporarily isolated. Vaccine strain 19 for cattle has been around since the mid-twentieth century and has been an excellent tool for countries with high prevalence rates. Its use in combination with diagnosis and slaughter has enabled several countries to achieve eradication; these countries are currently free of the disease. In recent decades, research has led to more reliable diagnostic technologies and better vaccines for use in the campaigns against brucellosis, as in the case of vaccine RB51, which makes it possible to protect livestock without interfering with routine diagnostic procedures.
Epidemiological control of brucellosis includes basic measures such as serological and bacteriological diagnosis, the labeling or identification of reactive animals, and their slaughter, coupled with intensive mass vaccination of females, both young and adult, especially in regions where the prevalence is medium or high. In a survey conducted in 24 Latin American countries by the Pan American Foot and Mouth Disease Center (PANAFTOSA), it was found that 22 of them used serological testing for diagnosis, and 18 of them, bacterial cultures, marking positive reactors; however, positive reactors are slaughtered in only 15 countries. Seventeen countries use vaccines: 9 countries use strain 19, two more use strain RB51 exclusively, and six more use both vaccines. Seven countries indicated that they do not use vaccines. Mass vaccination should be promoted.

8.1.3 Epidemiological Surveillance

In territories subject to epidemiological surveillance, the differences in risk between herds used for different types of production are evident; the prevalence in livestock used extensively in beef production or in dual-purpose production tends to be low; while in dairy herds it tends to be higher and the eradication programs more complex and expensive.

An elementary surveillance tool is the registry of cases of the disease. However, this is not routine in many Latin American countries, as the aforementioned survey by PANAFTOSA discovered; only 15 out of 24 countries indicated that they had registration processes.

8.1.4 Brucellosis in Goats in the Hemisphere

It is known that caprine brucellosis exists chiefly in Argentina, Bolivia, Mexico, Paraguay, and Peru, while there are no formal reports of the disease in the Caribbean. It should be pointed out that the bacterium responsible for the disease in goats is the most important causative agent of brucellosis in human beings, still known as Malta fever. Notwithstanding, epidemiological surveillance of brucellosis in goats is not routine in the majority of countries in the Hemisphere.

Efforts to combat this disease in goats as well as cattle involve serological diagnosis for the identification and elimination of reactive animals, combined with vaccination. The official vaccine in most countries is prepared with the Rev.-1 strain. Mexico has carried out a series of mass vaccination campaigns in enzootic regions, which has made it possible to control and reduce the problem in goats and indirectly, in the human population. This program has been overseen and reoriented by PAHO/WHO.
8.1.5 Brucellosis in Humans

Brucellosis has a social impact on the population, because it is an incapacitating and chronic illness, which implies supervised medical care and ultimately, hospitalization. The impact is more severe when the patient is the head of the household, since the disease directly affects the patient’s ability to contribute to the family income. The economic impact consists chiefly of the cost of diagnosis and treatment and the losses stemming from the patient’s inability to work.

In Mexico, data compiled by the Secretariat of Health reveal that in the past 10 years, an average of 3,900 new cases in humans have been reported annually. The highest number of cases in this period was reported in 1992, with 5,958 cases; by 2000, that number had fallen to 2,087 (Figure 1). This reduction was due in part to the goat vaccination program implemented in the high-risk regions of the country. Analysis of the data for 1996 indicated that in 94% of the cases, the source of infection in humans was contaminated food, especially cheese and raw milk. Housewives and schoolchildren are the populations most often affected (24% and 25% respectively), followed by shepherds (12%), with the remainder consisting of livestock owners, workers, merchants, and milkers.

Figure 1. Cases of Human Brucellosis in Mexico
1990 - 2000

Information on the presence of brucellosis in humans in some countries in the Hemisphere is limited, probably due to the lack of diagnosis and to underreporting; however, some figures reveal that in the period 1994-1998 a total of 29,132 cases in humans were reported in 20 countries of the Americas, with 54.5% corresponding to
North America, 44% to South America; 1.3% to the Caribbean, and 0.2% to Central America.

In the past, anti-brucellosis campaigns were carried out in Mexico, especially on modernized farms. More traditional farms with less sophisticated technology were not subject to preventive interventions or epidemiological surveillance, which means that protected animals have lived side by side with susceptible and infected animals. The new strategies being applied in Mexico are aimed at overcoming this weakness: By regionalizing the activities of the anti-brucellosis campaign we intend to achieve full coverage through vaccination activities that sequentially include the entire population, targeting disease-free areas first and subsequently expanding them.

8.2 Bovine Tuberculosis

8.2.1 History in the Region

Efforts to control and eliminate bovine tuberculosis in the Americas have been ongoing but insufficient, marked by joint activities and agreements among the countries of the Region. Among the actions taken in this regard, the VII Inter-American Meeting, at the Ministerial Level, on Animal Health (RIMSA VII), held in Washington, D.C. in April 1991, adopted Resolution Rimsa7.R11 requesting the Director of PAHO to prepare a Plan of Action for the Eradication of Bovine Tuberculosis in the Americas, in consultation with the governments of the Member States—through their national program authorities and with international experts—in order to study the problem and draft specific proposals and norms for action in this area. This resolution led PAHO to convene a meeting in Saltillo, Coahuila, Mexico from 18 to 20 November 1991 to review the epidemiological situation and the technical resources available to combat this disease and to share the experiences of the national programs. At the meeting, a Plan of Action was presented to the participants; it was later approved and adopted as a resolution by RIMSA VIII, held in Washington, D.C. in April 1993 (Resolution Rimsa8.R26: Plan of Action for Eradication of Bovine Tuberculosis in the Americas).

8.2.2 Importance of Bovine Tuberculosis as a Zoonosis

Bovine tuberculosis is one of the most important zoonoses in the Region of the Americas. The presence of this disease in livestock is a constraint to the production and marketing of cattle. However, as a risk to public health its importance is even greater.

The disease is transmitted to humans through contact with infected animals, or through the consumption of unpasteurized milk and dairy products. Even though pasteurizing milk eliminates the problem of transmission, in several countries of the Region, particularly those with lower levels of development, most of the milk consumed is neither pasteurized nor boiled.
Information on the frequency of tuberculosis in humans where infected cattle are implicated is limited in Latin America. Conservative estimates indicate that of the total number of cases in humans, 2% of pulmonary and 8% of extrapulmonary tuberculosis are attributable to the bacterium that causes the disease in livestock. The lack of data is due to the fact that many public health laboratories do not employ the necessary techniques for identifying in humans the causative agent of the disease in cattle, and death certificates do not record the extrapulmonary tuberculosis found in autopsies performed by medical personnel.

8.2.3 Situation of the Programs to Combat Bovine Tuberculosis Programs in the Americas

The disease is widespread in the animal populations of the Region. A 1998 study on zoonotic tuberculosis in developing countries indicates that of the 24 countries investigated in Latin America and the Caribbean, 12 of them reported the prevalence of bovine tuberculosis as sporadic and low, seven described it as enzootic, and only one described it as a disease with a high frequency. The same study indicates that only 12 countries employ control measures as part of a testing and slaughter policy and consider tuberculosis a reportable disease; in the remainder, the disease is only partially controlled or not at all. However, a study published by PANAFTOSA/PAHO in January 2000 shows that of the 24 countries surveyed, 22 responded that tuberculosis in cattle is a reportable disease. Fourteen countries indicated compulsory reporting of the disease in pigs, and 12 countries, in goats.

8.2.4 Administration of Tuberculin Tests

A fundamental weapon in combating tuberculosis is diagnosis through tuberculin skin testing, combined with the segregation and slaughter of reactive animals. Despite the surprising technological advances in other areas, diagnostic techniques for tuberculosis have not been developed that can replace the tuberculin test. Several tests are in development; however, they are still not as reliable or as affordable to country programs as the tuberculin test.

In 21 out of the 24 countries surveyed by PANAFTOSA, use of the tuberculin test in herds with suspected or confirmed cases of tuberculosis infection is compulsory. From the responses of the countries surveyed, it is clear that different criteria are used to interpret the results of tuberculin tests, which makes it difficult to compare the epidemiological situation of the countries of the Region. It is therefore suggested that the criteria be standardized.

Progress in the programs to combat tuberculosis depends in large measure on the quality, consistency, and availability of the bovine and avian tuberculin for the dual test (PPD) used in the diagnostic test. In Mexico, the responsibility for producing excellent
quality tuberculin PPD in sufficient volumes to meet needs at the national level and even for export, corresponds to the National Veterinary Biologicals Producer (PRONABIVE). Mexico's campaign to control and eradicate tuberculosis administers a little over 3.5 million doses of PPD annually.

8.2.5 Inspection in Slaughterhouses

Epidemiological surveillance in slaughterhouses, through the inspection of carcasses, makes it possible to detect animals with lesions suggestive of tuberculosis in order to begin epidemiological screening until the focus of the infection is found and controlled. Given the huge numbers of animals slaughtered daily, epidemiological surveillance based on ante-mortem and post-mortem inspection in slaughterhouses provides hard information that offers essential comparative advantages. We are trying to use this type of epidemiological surveillance in Mexico, since a large number of animals can be inspected by a single veterinarian at minimal cost. The ability to perform epidemiological screening, tracing the infection back to the herd of origin, makes it potentially one of the most worthwhile activities of the bovine tuberculosis programs, not to mention its application in the study of other diseases. According to the PANAFTOSA survey, this type of official inspection is conducted in 2,125 slaughterhouses in 22 countries.

8.2.6 Slaughter of Positive Tuberculin Reactors

In order to achieve eradication, all reactive animals must be slaughtered to prevent the continued spread of the disease. If this is not done and infected animals are allowed to remain with the herd, all control and eradication efforts will be for naught.

The slaughter of animals with a positive reaction to the tuberculin test is mandatory in the sanitary regulations of only 16 of the 24 countries surveyed, and the rule is not enforced in all the countries with regulations of this type. The reasons are economic; hence, the importance of resources for indemnifying producers to encourage them to eliminate the disease on their property.

Economic constraints generate a vicious circle: positive reactors are not slaughtered due to the lack of resources. Their continued presence facilitates the spread of the disease, leading to the appearance of new reactive animals. This makes the campaign's program to slaughter reactive animals more expensive, thus perpetuating the problem.

8.2.7 Prospects for Bovine Tuberculosis in the Region

Control and elimination of bovine tuberculosis in the Region varies widely, ranging from disease-free countries to countries without a control program.
The responsibility for this program cannot rest solely with the governments. The joint participation of producers, industry, and merchants, as well as the ministries of agriculture and health, is essential.

The testing and slaughter strategy has proven effective when prevalence is low. The picture is different when the prevalence is high and the resources to indemnify producers for the slaughter of positive reactors are not available, with livestock owners bearing the entire cost. This causes affected livestock producers to reject the strategy, constituting a serious obstacle to the success of these programs.

Research to find an effective immunogen for tuberculosis control—or else a vaccination/diagnosis system that would make it possible to differentiate infected animals from vaccinated animals—would definitely offer hope that this illness could be controlled in countries where the testing and slaughter system is not feasible. However, it will be some time before researchers around the world can demonstrate satisfactory results and strategies of prevention through immunization can be adopted.

9. Short- and Medium-term Prospects

Sanitary campaigns should differentiate livestock by species and by type of production. It is recommended that countries take their epidemiological and public health priorities as a starting point, moving from the simpler to the more complex.

9.1. Eradication in Beef Cattle

Regionalization. The need for regionalization in the countries to implement the campaign strategies to eliminate tuberculosis and brucellosis in beef cattle has been demonstrated in a number of countries. Breaking activities down into geographical and economic areas, targeting livestock with similar characteristics, facilitates homogeneous action, optimizing human, material, and financial resources for that region.

Strategic concentration of efforts and resources. Resources are regularly allocated for a particular campaign and are distributed across the length and breadth of a territory. This results in their dilution, since every region receives less resources than it needs. In planning campaigns it is important to give priority to the designated regions and allocate resources to them to achieve more rapid progress. Once the problems are solved in the regions with higher priority, resources are allocated to adjacent regions, thus ensuring sequential progress in the control and elimination of the diseases.

Mop-up campaigns and the elimination of reactors. The mop-up strategy in beef cattle has replaced the disease-free herds strategy. This strategy considers a region as the universe of activities and tests all animals in every herd, immediately eliminating reactors, so that when the mop-up effort is over, all animals at risk have been eliminated.
In addition, properties where reactive animals have been identified are cleansed until the disease has, rapidly and at low cost, been completely eliminated in the region.

Inspection, diagnosis, and quarantine. These three procedures are the foundation for eliminating tuberculosis and brucellosis in beef cattle, with vaccination added for the specific case of brucellosis.

9.2 Elimination of Bovine Tuberculosis and Brucellosis in Livestock for Dairy Production

Quarantine. Due to the high risk posed by the livestock used in dairy production, it is essential to impose a quarantine on properties where tuberculosis or brucellosis has been detected. During the quarantine, infected animals should not be transferred from one production unit to another, due to the risk of spreading the diseases. At the end of their productive life, all animals from quarantined stables should be taken to authorized slaughterhouses with facilities for postmortem inspection.

Controlled production units. These are officially-monitored properties where animals that have tested positive can temporarily be isolated in a way that will permit them to live out their productive life and subsequently be sent to authorized slaughterhouses. This mechanism makes it possible to cleanse a herd rapidly without immediately slaughtering the animals, allowing them to remain productive until the end of the cycle, to the benefit of producers.

Disease-free herds. In dairy livestock, certification of disease-free herds plays an important role, due to the high genetic value of the animals. The certification process is a technical aspect that should be overseen by government authorities in each country. Moreover, it is advisable to offer incentives to dairy producers who clean up their herds and certify them as disease-free, paying higher prices for their products.

10. Insurance

Companies that insure against livestock diseases can play an effective role in supporting programs for the control and eradication of bovine tuberculosis and brucellosis. Their involvement is especially feasible in areas where the prevalence of these diseases is low.

Collective insurance packages covering broad areas or regions are recommended. This will benefit producers by lowering insurance premiums.
11. Development of Operating and Financing Systems Involving Co-participation

Recognizing that without the involvement of stakeholders it will be impossible to make real progress in the control and elimination of the diseases that concern us here, it is necessary for each country to develop local systems that promote cooperation between the public and private sectors. Plans and programs should be formulated for joint participation, identifying the necessary administrative, technical, and financial components to ensure that their implementation and operation will guarantee real progress in the elimination of these diseases.

12. Final Considerations

Latin America should redouble its efforts to combat brucellosis and tuberculosis, organizing its plans around regionalization. This will make it possible to implement strategies suited to the cultural conditions of the various regions in each country, as well as the geographical characteristics, the communications infrastructure, and production systems. Eradication objectives can be met in the short term in regions with adequate communication systems, modern farming techniques, accurate censuses, identified animals, and where producers and the authorities strictly comply with and are committed to the epidemiological measures to combat these diseases. At the same time, we must continue to work in regions that are socially and culturally behind to control both of these zoonoses through intensive vaccination programs in the case of brucellosis; the goal in the medium term is for programs in these regions to assume a more rigorous stance focused on the total elimination of these diseases.

We have a real challenge before us: to demonstrate to the world our capacity, our wisdom, and our commitment to improving animal health and public health in order to increase the well-being of the inhabitants of the countries of the Region.