

THE PRESENT STATUS OF THE ERADICATION OF TUBERCULOSIS AND BRUCELLOSIS IN CATTLE¹

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Tuberculosis and brucellosis in the cattle population of our country have taken a tremendous toll during the past years. Fortunately, the livestock producers of the United States have developed the philosophy that animal diseases should be eradicated, whenever possible, rather than be allowed to continue in their herds and flocks. This philosophy has helped to maintain our high standard of living, and to a great extent has raised the economic status of our country. This decision was first made in relation to tuberculosis in cattle back in 1917, when the tuberculosis eradication program was initiated. At that time, almost 5 percent of all the cattle in the United States were infected with the disease. In the States with a high concentration of dairy cattle, the percentage of infection was much higher. Diseased animals moved without restriction from farm to farm. Calves nursed infected dams, and drank pooled, unpasteurized milk, which served as almost certain sources of infection.

Infected animals remained in the herd until they died of the disease, until they became emaciated and an economic liability, or until the disease had progressed to the point where it could be diagnosed clinically. The annual losses to the livestock industry would be difficult to calculate, but they were enormous.

Twenty-three years later, in 1940, the incidence of tuberculosis in cattle had been reduced to less than one-half of one percent in all States, and the entire nation achieved a Modified Accredited status.

During the next 12 years, the number of reactors found continued to decline until, in 1952, the disease hit a low point of 0.11 percent of all animals tested, or 11 animals in each 10,000. Since the incidence of infection had continued to drop during and after the war, in spite of a shortage of personnel and a decrease in the amount of testing, a false sense of security was established. Most people felt that the disease had been licked. Public interest shifted from tuberculosis to other diseases. As tuberculosis received less and less emphasis, funds for testing, research, and education dwindled, while costs to conduct such programs rose.

The low point of 0.11 percent, achieved in 1952, became not a point in our progress towards eradication but a plateau, a holding point, during the next two years.

In 1955 the number of reactors started to rise. It continued to climb until, in 1959, a total of 23 out of every 10,000 animals tested were tagged as reactors — the number of reactors had doubled in four years.

To combat complacency and to revitalize the tuberculosis eradication program, three major conferences on tuberculosis were held in 1958 and 1959, in Michigan, Wisconsin, and Kansas. At these meetings, national authorities on tuberculosis research, education, and regulatory problems, reviewed, evaluated, and discussed program procedures, testing techniques, and equipment, and the effects of human and avian tuberculosis.

Conferences at Denver, Colorado, and at Charleston, West Virginia, during the past year, brought together laboratory personnel from State, Federal, university and other research and diagnostic laboratories, to review laboratory procedures and problems, to standardize techniques, and to stimulate tuberculosis research.

Our basic tool for the eradication of tuberculosis was, and still is, the intradermal tuberculin test. Its effectiveness is demonstrated by the results described, and by the experience of many other countries throughout the world.

Early workers with this product recognized certain inherent weaknesses, which though insignificant in the early phases of the program, would assume greater significance as the incidence of infection approached zero. Other forms of tuberculosis can, in some instances, produce hypersensitization to tuberculin, and some degree of response to the test. At the inception of the program, therefore, eradication was not directed exclusively to cattle, but to other livestock and to poultry as well. To completely eradicate tuberculosis in cattle, it may be necessary to eliminate tuberculosis from all species, including man.

In the fiscal year 1960, approximately 2½ percent of all swine slaughtered in Federally-inspected establishments showed some evidence of tuberculosis. Almost 6,000 carcasses were condemned. While these figures represent a marked reduction during the past 40 years, they show that tuberculosis is still with us,

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presenting a real challenge to our program. Relatively little poultry testing is being performed at the present time, but avian tuberculosis presents a problem in some areas. Most swine infection is of avian origin. It is anticipated that increased utilization of laboratory facilities will demonstrate avian infection in a significant number of cattle. Paratuberculosis is also a disease to be reckoned with, since *Mycobacterium paratuberculosis* is capable of producing tuberculin sensitization in cattle. Acid-fast bacteria in so-called skin lesions may be a factor. Possibly other bacteria or factors as yet unknown may be involved. Field studies and research projects, now under way in several areas, will assist in providing additional information concerning these and other related problems.

It should be understood that requirements for the reaccreditation of herds and areas, as outlined in the Uniform Methods and Rules for Tuberculosis Eradication, represent minimum standards.

Several States test more than the required number of cattle, and we feel that additional testing, when economically feasible, is desirable and contributes substantially to the progress of the eradication program. This is especially true in areas of high cattle concentration.

During the past fiscal year, nearly 9½ million cattle were tested for tuberculosis. This is the greatest number tested in a single year since 1954; 0.15 percent of that number were classed as reactors, which is an improvement over the previous fiscal year when 0.23 percent reactors were found as stated previously. This is quite an improvement but we must continue to guard against complacency in our efforts for complete eradication of this disease. The eradication of tuberculosis in cattle is a goal well worth our efforts. We must continue to reduce the incidence of the disease until it no longer exists in our country.

The concerted effort to control and eradicate brucellosis in this country was started in 1934. Testing during the early years of the program indicated that there were approximately 4 million diseased cows in some 1¼ million infected herds. Economic losses were estimated to be in excess of 100 million dollars each year. The effects of war were also felt by the brucellosis eradication program and ground was lost during that period. Fortunately, an effective vaccine against the disease was introduced in 1941. By conferring a relatively high degree of resistance in most animals vaccinated with Strain 19 *Brucella* vaccine, it then became possible to limit or slow the spread of infection until diseased animals could be located and eliminated. This vaccine has stood the test through the years; 6½ million calves are now being vaccinated annually. It is desirable that this num-

ber be increased to help protect the status that has been attained.

Today more than 90 percent of the brucellosis that once existed in the United States has been eliminated. Once we had more than a million infected herds, but the disease was found in only 32 thousand last year. All States in the Union are actively participating in complete area programs designed to wipe out the disease, county by county. 2,100 counties (two-thirds of all counties in the Nation) have been completely tested and are now Modified Certified Brucellosis Areas. All counties in 26 States plus Puerto Rico and the Virgin Islands have reached that status. This means that not more than 1 percent of the cattle in not more than 5 percent of the herds were found to be infected at the time of qualifying for certification. Infected herds are quarantined and retested until the disease is eliminated.

Across the nation there are 360 counties now conducting complete testing leading to certification, leaving only 692 yet to join the program. By 1965 all counties in the Nation will have had an opportunity to participate. If any counties remain after that date, it will be only because the livestock owners have not yet requested area participation. All States should urge neighboring areas to move toward eradication as rapidly as possible, for reintroduction of the disease will certainly be more difficult if all areas approach eradication simultaneously.

One of the most important factors in the brucellosis eradication program was the development of the milk ring test. By this test almost a million commercial dairy herds are screened for suspicious reactions every 4 to 6 months. Only the suspicious herds and those not covered by the screen test need be blood tested. This has eliminated more than 97 percent of the testing of dairy herds and has permitted the concentration of blood testing activities in those herds most likely to be infected. Costs have been reduced greatly and the services of the limited number of available veterinarians have been effectively utilized.

Another program which promises to be nearly as effective as the milk ring test in finding infected herds is the testing, at time of slaughter, of properly identified beef and dairy cows. Blood test reactors among such cattle will point suspicion toward the herds from which they originated. These herds can then be blood tested and the disease eliminated. This program, called "the market cattle testing program," has already proved a boon to beef producers in many western States, and is being adopted in the east as well. Obviously, the more often we can screen our herds, the more quickly the disease will be found. Eradication will depend upon prompt detection of infection wherever it may occur.

The northeastern States have led the Nation in the eradication of brucellosis. All have achieved modified-certified status. North Carolina was the first State, New Hampshire and Maine - second and third. South Carolina, Virginia, Illinois, Ohio, and Kentucky are expected to join the ranks of the modified-certified States during the next two years. All but six States have set goals of modified-certified status by 1965 or before. Alaska, Florida, Louisiana, Ohio, Texas, and Wyoming have not as yet established such goals. However, it certainly would appear that the entire nation could be modified-certified by 1966.

A new category has been added to the status of areas in the brucellosis program during the past year. It has been given the name of Certified-Brucellosis-Free area. One State has moved on to this enviable position. New Hampshire was recognized as brucellosis free in April of last year by eliminating the disease from the last known infected herd. Three more States, Maine, Rhode Island, and Connecticut, all New England States, hope to qualify for State-wide brucellosis-free status during this calendar year.

There are thirty-four counties in eight States other than New Hampshire which have qualified as brucellosis-free. These counties are in Maine, Massachusetts, Minnesota, New Jersey, North Carolina, Pennsylvania, West Virginia, and Wisconsin. Naturally, we look forward to the day when the entire nation can be so classified.

Although the livestock industry and all others involved can take a great measure of pride in past achievements, we must take a realistic look at the task ahead. While the majority of herds have been freed of brucellosis by blood testing, removing diseased animals, vaccinating, and cleaning and disinfecting the premises, some have remained infected. Specially trained veterinarians are now working in many of the certified States to clean up these "prob-

lem herds." These men are equipped to apply a number of supplemental tests and procedures which aid materially in locating and eliminating brucellosis. Because of the intensive nature of the work of these "epidemiologists," they work most effectively in areas where the disease has been reduced to a very low level and where they have the complete cooperation of the livestock owners. Under their supervision, "problem herd" lists are shrinking at a gratifying rate in all certified States. For instance, reactors are being found in 45 percent fewer herds this year than last in the certified States. In 1960, only 5,727 infected animals were found in the eleven northeastern States - Maine, New Hampshire, Vermont, Connecticut, Massachusetts, Rhode Island, New York, Pennsylvania, New Jersey, Delaware, and Maryland. There is a total cow population of almost 4 million in these States.

When brucellosis reaches such low levels there is a real danger of complacency entering the picture and nullifying efforts to finish the job. This we learned from our tuberculosis eradication program. We must attack the problem with renewed vigor and enthusiasm in all areas if we are to be successful in eradicating brucellosis.

Because of our large cattle population, the seemingly endless movements in our markets and other channels of trade, the degree to which both tuberculosis and brucellosis had become established before eradication programs were initiated, and because of other factors; it is generally recognized throughout the world that the programs to eradicate tuberculosis and brucellosis in this country are the greatest attempts to eliminate animal disease ever undertaken in history. The progress being made is indicative of the success that is bound to come, if all segments of the industry continue their efforts in support of the programs.