

BOVINE CONTAGIOUS ABORTION AS IT APPEARED IN PORTO RICO IN 1923

ITS BACTERIOLOGICAL DIAGNOSIS

By DR. P. MORALES OTERO, Director Biological Laboratory.

Last year the Laboratory of the Department of Health of Porto Rico was requested to assist Dr. Alfonso Rivera, who was then serving as Veterinarian for the Insular Experimental Station, in finding the cause of repeated abortion in a herd at Río Piedras. "Endemic Abortion" was unknown as a disease in Porto Rico, at that time, but the frequent premature expulsion of the fetus in several herds of imported cows led Dr. Rivera to suspect that said disease was in the Island. Soon native cows of adjacent herds showed symptoms of the disease and a formidable siege of abortions started which caused veterinarians and dairymen to consider conditions as serious.

The first step taken was to determine the causative agent of the outbreak. Several cultures were planted from exudates of placentae, and from the heart and lungs of a fetus. Isolation and cultivation of the causative agent was carried out with great difficulty. Blood serum, gelatin broth and gelatin-serum-agar were used as culture media. The tubes were inoculated with the suspected material and kept at 37° C. Within three or four days, small punctiform colonies developed. They grew well below the surface of the gelatin and in anaerobic conditions. The colonies were small, compact, round and irregular and had irregular outlines, surrounded by lighter zones. Smears were made and stained by Gram's method, with methylene blue and gentian violet. The organisms stained well and showed involution forms. They were non-motile, had neither capsules nor spores, and were Gram negative. From all these morphological, staining and cultural characteristics it was concluded that the *Bacterium Abortus* (Abortion Bacillus of Bang) was the causative agent of the disease which had to be dealt with. Furthermore, intraperitoneal injections of emulsions of this culture were given to guinea pigs and intense reactions and chronic infections with characteristic changes in the spleen, liver and joints followed, which confirmed our suspicions.

Every stockman should realize the fact that several abortions accompanied by the characteristic discharge is sufficient to cause suspicion of the presence of the disease. The bacteriological diagnosis can be made certain by the isolation and culture of the specific organism as explained above. A tentative diagnosis can be made rapidly by preparing stained specimens and demonstrating the presence of the short Gram negative bacillus in the uterine discharge. Besides, agglutination tests and complement fixation tests can be used to give an idea of the extent of infection in the herd, for animals giving a positive reaction are the ones most likely to abort in the future. The agglutination test consists in bringing small amounts of diluted blood serum of the animal that is to be tested, into contact with a 1 per cent suspension of the *Bacillus Abortus* in normal saline. The dilution of the serum should be made 1 to 100 and 1 to 1,000. The test can be made to be observed either microscopically or macroscopically. In the latter, equal quantities of the diluted serum and suspension are brought together in a test tube and incubated for forty-eight hours. In case the serum shows a positive reaction it means that the blood of the animal contains agglutinines that will act on the organism so that they will clump together, or settle in the bottom of the tube, leaving the supernatant salt solution clear.

The microscopical test is carried on in the same manner as a Widal Reaction, using higher dilutions as 1 to 100 and 1 to 500. The hanging drops should be incubated for one hour. The agglutinines found in the blood of cattle affected by *Bacillus Abortus* are specific for the infecting organism and will agglutinate no other. A positive reaction indicates that the animal from which the blood was drawn is infected with the disease. Vaccinated cattle give a positive or incomplete reaction. Animals may be immune to the disease and yet become carriers and spread virulent cultures of the bacilli in all their secretions. These animals are a menace, especially when they come in contact with others that are not immune to the disease. It has been definitely proven by the "California Experimental Station" that once the organism reaches the supramammary glands and the udder of the cow, the animal becomes a "carrier". This can be determined by examining the milk for *Bacillus Abortus Endimici*. Carriers are very hard to treat, and several authorities recommend slaughter in such cases. The best preventive treatment so far known for this disease is vaccination. Very poor results have been obtained by using dead bacilli in emulsion, but results are most satisfactory when living emulsions are used.

It is earnestly recommended that the dairymen of Porto Rico have their vaccines prepared here in Porto Rico so as to use the same strains of the organism that are causing the infection in the herd. If this be done and all necessary precautions are taken there is reason to believe that the results will be most satisfactory. Stockmen must bear in mind that the disease is here, and that all in their power should be done to control it. This infection causes great losses on the mainland, and will ruin the live-stock industry in Porto Rico if every live-stock owner does not learn the fundamental facts regarding the prevention of infection in the herd, and the control of it after it has gained a foothold.

CONCLUSIONS

1. That contagious abortion of cattle is present in Porto Rico, several herds having been infected with the disease at Río Piedras and Bayamón.

2. That the causative agent of the outbreak is the *Bacillus Abortus Endemici* (Bang) which has been isolated and cultivated for the first time in the Island.

3. That stockmen must adopt drastic measures to control the disease, and that the laboratory can help them as follows:

(a) By repeatedly testing the affected herds by the agglutination and complement fixation tests; (b) by making bacteriological diagnosis in affected animals and determining the causative agent; (c) by preparing vaccines from the particular strains isolated from each herd.

4. That imported cows should be tested for *Bacillus Abortus* before mixing them with healthy herds, and if carriers are found they should be isolated or slaughtered.