

THE INCIDENCE OF BRUCELLOSIS AMONG CATTLE AND CARABAOS IN THE PHILIPPINES

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Introduction

Brucellosis or Bang's disease, a highly infectious disease affecting both man and animals has long been known to be present in the Philippines and in many countries of the world. This disease is a major cause of abortion, sterility, resulting in a serious economic loss to the livestock industry. It is also a well-known fact that brucellosis, aside from its economic importance, is also a great public health menace.

The presence of the disease in the Philippines was first reported in swine by Dr. Teodulo Topacio, Sr. in 1932, although *Brucella* infection in swine was first suspected in 1918 among imported breeding sows. Several Filipino veterinarians became interested in making incidence studies in swine by serological means. Topacio (1937), first reported an incidence of 2.2 per cent positive from a total of 1,975 blood specimens collected from the Manila Slaughterhouse. San Agustin (1949), made an observation on the incidence of the infection in three major swine herds. The three herds gave the following incidence of positive reactors as: 11.8 per cent, 10.09 per cent, and 11.93 per cent, respectively. In another survey conducted by San Agustin (1949) among slaughtered pigs from the Manila Slaughterhouse, he found a 9.06 per cent incidence of positive reactors serologically. San Agustin and Castillo (1950), did another survey from the same place and gave a 0.53 per cent incidence.

The status of brucellosis in cattle and carabaos in the Philippines

From unpublished sources, it has been known that on several occasions during the existence in Manila of the U.S. Army Medical Research Board Laboratory, Army veterinarians tried to determine the presence of bovine infectious abortion among several small dairies in the city and other places but failed to detect the disease. Topacio and Acevedo (1939) reported cases of infectious abortion in imported dairy cows in two dairy farms. Isolation and serological tests were done to confirm the disease. In 1958, Coronel reported the results of a four-year survey which was conducted to determine the incidence of *Brucella* reactors in the dairy farms in the Philippines from 1953 to 1956. Rough estimates showed that the collective incidence of the disease among cattle in the various Philippine dairy farms dropped from 15 per cent positive reactors in FY-1952-1953 to 13 per cent in FY-1953-1954, 10 per cent in FY-1954-1955, and 3 per cent in FY-1955-1956.

Ching (1964) conducted a serological test for the presence of *Brucella abortus* antibodies in native cattle utilizing the rapid plate test. Only 3 out of 138 serum samples tested or 2.17 per cent gave positive results whereas, 18 or 13.04 per cent gave suspicious reactions. The rest were negative. All positive reactors were females. His results were inconclusive although they indicated the presence of brucellosis among the native stock of cattle.

The first serological test for the presence of *Brucella abortus* antibodies in native carabaos using the microscopic tube agglutination test was done in 1964 by Cordero. Only 6 or 3 per cent out of 200 samples gave positive results; 44 or 22 per cent, suspicious; and the rest (75 per cent) were considered negative. A similar study was done by Abrena in the same year on the blood of native carabaos. She utilized the rapid plate test. Out of 130 animals examined, 19 or 85.03 per cent were negative to the test. Only 3 or 2.30 per cent of those with a blood test gave positive results and 16 animals or 12.30 per cent were found to be suspicious. Although both studies were done on a limited

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number of animals which might not justifiably represent the whole carabao population in the country, the results strongly indicate the presence of brucellosis among Philippine carabaos.

Arambulo III (1971), also reported a 5 per cent incidence of the disease in a dairy herd in the Province of Cavite and outbreaks of infectious abortion associated with *Brucella abortus* were recorded in dairy herds composed of imported cows in Cebu City and Bulacan province.

Gatapia, Castillo, and Carlos in 1971 reported the results of a six-year (1965-1971) survey on the incidence of brucellosis among cattle and carabaos slaughtered at the National Abattoir in the Philippines. The outcome of the study was based on 4,309 blood samples: 2,904 from cattle and 1,405 from carabaos which were tested with the aid of the serum plate (rapid) agglutination test. The survey showed that the incidence of reactors to brucellosis was 7.03 per cent in cattle and 3.28 per cent in carabaos. It was also found that the incidence in cattle was high among the ten-year-old-group and highest in the over ten years of age in carabaos. The investigation showed that the disease had spread to about fifty per cent of the provinces in the Philippines where both animals are raised. It is further established that the incidence of brucellosis in cattle is twice that in carabaos. This has to be expected since there is no organized carabao farm in the country so that there is lesser contact among these species of animals, hence less chances for the infection to disseminate and therefore, a lower incidence.

In another survey (1971 to 1976) on the incidence of brucellosis among cattle and carabaos slaughtered at the National Abattoir, a total of 1,683 blood samples were taken from carabaos. Results showed that the incidence of the disease in both species of animals had dropped, when compared with the results reported by Gatapia, Castillo and Carlos (1971), from 7.03 per cent to 3.30 per cent of positive reactors in cattle. Suspicious reactors were 16 or 1.39 per cent and the rest 1,097 or 95.31 per cent were negative. In carabaos, the trend of the incidence of positive reactors has dropped also from 3.28 per cent to 1.13 per cent. Out of the 6 positive reactors, 5 were males while only 1 was a female. Results showed also that the incidence was high in the fifteen-year-old group.

From 1978 to 1979, a total of 1,397 blood samples from cattle have been examined for contagious abortion utilizing the rapid plate agglutination test. The blood samples were collected from the different stock farms and dairy farms of the Bureau of Animal Industry while some of them were collected from commercial livestock farms. Out of the 1,397 blood samples examined, 1,200 (or 85.90 per cent) samples were negative to the test. Only 135 (9.66 per cent) samples gave suspicious reactions and 62 (4.43 per cent) samples were found to be positive.

Table 1, shows the incidence of positive reactors to brucellosis in cattle from 1953 to the present. It is noted that generally, the incidence has dropped from 15 per cent to 4.43 per cent within a period of twenty-five years. This can be attributed to the fact that calthood vaccination against brucellosis is being practiced in some farms in the Philippines.

Table 1 Incidence of brucellosis in cattle

| Year | Investigator/s | Per Cent Reactors |
|-----------|------------------------------|-------------------|
| 1953 | Topacio, Sr. & Acevedo | 15 |
| 1954 | Topacio, Sr. & Acevedo | 13 |
| 1955 | Topacio, Sr. & Acevedo | 10 |
| 1956 | Topacio, Sr. & Acevedo | 3 |
| 1964 | Ching | 2.17 |
| 1965-1971 | Gatapia, Castillo and Carlos | 7.03 |
| 1971 | Arambulo III | 5.0 |
| 1971-1976 | Carlos | 3.30 |
| 1978-1979 | Carlos | 4.43 |

Table 2, shows the incidence of positive reactors to brucellosis in carabaos. For the period of ten years, the incidence has decreased to more than fifty per cent. The chances of the infection to disseminate is less due to lesser contact among the animals.

This is the present status of brucellosis among cattle and carabaos in the Philippines.

Table 2 Incidence of brucellosis in carabaos

| Year | Investigator/s | Per Cent Reactors |
|-----------|------------------------------|-------------------|
| 1964 | Cordero | 3 |
| 1964 | Abrena | 2.3 |
| 1965-1971 | Gatapia, Castillo and Carlos | 3.28 |
| 1971-1976 | Carlos | 1.13 |

Present researches being undertaken

At present the Research Division of the Bureau of Animal Industry is undertaking one research on brucellosis, namely the production of local antigens for the diagnosis of brucellosis. The project aims to compare the different kinds of *Brucella abortus* antigen for rapid plate agglutination, whole blood field agglutination antigen, and tube agglutination test antigen. Comparative study of these three kinds is highly significant to know which of these is the most convenient to use and yet will give the most accurate diagnosis.

One of the main problems in the Philippines for the diagnosis of brucellosis is the high cost and unavailability of the antigen. Should we become able to establish our main objective in our present research project, there will be no need to import antigens for the detection of *Brucella abortus* antibodies which are expensive and are not available locally. Successful results of this study will therefore be of great value to diagnosticians and researchers as well.

Conclusion

Brucellosis is a well established disease in the Philippines as shown by the reports of veterinarians from 1953 to the present. The incidence of positive reactors has dropped from 15 per cent to 4.43 per cent in cattle and 3 per cent to 1.13 per cent in carabaos.

Regular and periodic serological testing of cattle and carabaos should be conducted particularly among breeder animals. Since no practical chemotherapeutic methods for use in combating *Brucella abortus* infections in cattle are known, culling of positive reactors is highly recommended. Another important recommendation is for the livestock raiser to see to it that before he purchases his replacement breeder stocks, they should first be tested for contagious abortion. Only negative reactors animals should be brought to the farm. A program of vaccination should be instituted in all livestock farms.

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Discussion

Sudana, G. (Indonesia): What is the animal husbandry system in the Philippines?

Answer: There are large commercial farms, mostly in Mindanao, as well as what we call "backyard farming" in which the farmer owns one or two animals.

Hashimoto, K. (Japan): In your presentation, you mentioned the term "local antigen" and "whole blood plate test". What is the meaning of these terms?

Answer: As commercial imported antigens are very expensive, for diagnosis purpose we use a culture of *Brucella abortus* strain 119-3 supplied to us by the National Animal Disease Center in Ames, Iowa. For antigen production, we follow the procedures and methods applied by the Center. We produce 3 types of antigens.

- 1) Antigens for rapid plate test
- 2) Antigens for tube test
- 3) Antigens for whole blood agglutination test (antigen for rapid plate test with the use of whole blood).

Gupta, B.K. (India): Is the antigen which is prepared locally and used for serological diagnosis of brucellosis in the Philippines standardized against International Standard Anti-serum?

Answer: No. We follow the procedure recommended by the National Animal Disease Center in which the Hopkins Vaccine Centrifuge is used for standardizing. Computation is made for the percentage of *Brucella* cells present. With the rapid plate agglutination antigen, cells are adjusted to 4 percent, in the case of the tube antigen, they are adjusted to 11 percent.

Snowdon, W.A. (Australia): To what do you attribute the reduction in the incidence of brucellosis in cattle from 15 percent to 4.43 percent during the period of the study from 1953 to 1978-79?

Answer: Probably the commercial farms have vaccinated their animals during that period. Vaccination is not usually practiced in the Philippines even in the Government farms.

Koh, J.G.W. (Singapore): Was any study carried out to compare the incidence of brucellosis in farms which vaccinate or do not vaccinate against brucellosis?

Answer: No studies have been made as the commercial farms which are the only ones to carry out vaccination are very secretive about their methods.

Ogata, M. (Japan): Are there any differences in susceptibility to *Brucella abortus* organism in cattle and carabaos?

Answer: Cattle are more susceptible because they have close contact with each other, unlike carabaos.