

JNSF 10-1-99  
636.085 (She 10-1-99)  
Animal Res.

## The Incidence of Brucellosis in the District of Colombo

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(Date of receipt : 10 September, 1981)

(Date of acceptance : 29 March 1982)

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**Abstract:** Incidence of Brucellosis in dairy herds in District of Colombo (now Districts of Colombo and Gampaha) has been surveyed by use of the Milk Ring Test (MRT) and confirmed by quantitative tests like Standard Agglutination Test (SAT) Complement Fixation Test (CFT) and Coombs Test (CT) on suspected sera. In all 305 herds involving 1478 dairy cows were tested giving herd infection of 1.6% and the individual animals infected as 0.9%. The comparatively low infection should not leave room for any complacency. The situation could very well signify the beginning of a widespread infection.

### 1. Introduction

Brucellosis has been prevalent in Sri Lanka for several years and therefore it is most appropriate to determine its incidence in localised areas through the veterinary services available in that area. The occurrence of Brucellosis in the country has been proved by serological evidence as well as isolation of the causal organism from aborting animals.<sup>5</sup>

The reluctance on the part of the owners to permit bleeding their cows for serological tests imposes a limitation of any widespread survey into the incidence of Brucellosis. On the other hand, the adoption of the Milk Ring Test (MRT) offers immense potentialities for screening a given population provided the test is reasonably specific and sensitive. The accepted status of the test is that it has found widespread use in localising infected herds, as well as in ensuring that *Brucella* free herds remain so.<sup>7</sup>

It was therefore decided to screen a representative population of cows in the District of Colombo, which is the area of operation of the Veterinary Investigation Centre, Welisara. This paper records the first detailed study of the incidence of Brucellosis in the District of Colombo (now Districts of Colombo and Gampaha).

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## 2. Materials and Methods

The population tested in the study is mainly the dairy cows which feed the milk collecting centres (MMC) situated in Narahenpita, Meepe, Minuwangoda, Badalgama and Nittambuwa that existed in District of Colombo in 1976. Milk suppliers of the Multi-Purpose Co-operative Society of Attanagalla were also tested. Also a few farms that did not supply milk to the National Milk Board were tested. The animals belonging to milk suppliers of Narahenpita, Meepe, Minuwangoda collecting centres and also those belonging to non-suppliers for Milk Board were tested on the MRT individually, whereas those relating to Badalgama, Nittambuwa centres and suppliers to Multi-Purpose Co-operative Society of Attanagalla were tested on bulk milk samples.

### 2.1 Scheme of Testing

If positive samples are encountered while testing bulk milk samples, all cows corresponding to that milk sample are tested individually on the MRT method in order to track the possible reactor/reactors. All individual animals found positive on the MRT are bled and Rose Bengal Plate Test (RBPT) undertaken on the sera at the Veterinary Investigation Centre, Welisara. Immaterial of the results of the RBPT of the serum, duplicate samples of the serum, and the milk preserved in merthiolate are forwarded to the Veterinary Research Institute, Gannoruwa, Peradeniya for testing on quantitative tests like Standard Agglutination Test (SAT), Complement Fixation Test (CFT) and Coombs Test (CT). All these three tests were done as no single diagnostic test suitable for routine use can be depended upon to detect every infected animal.<sup>2</sup> Therefore, cows whose serum react on RBPT and give minimum titres for positiveness, by any one of the above tests, are considered infected with Brucellosis.

### 2.2. Tests Used

1. *Milk Ring Test*:- The test is based on coloured antigen employed reacting with the antibody present in the milk sample and the agglutinating mass thus produced coating itself on the fat globules. The fat globules aggregating antibody normally present in the fresh milk, which rises to the surface of milk column to produce the cream layer.

Thus a positive reaction is indicated by a coloured cream ring on the top and white milk column below, whereas a negative reaction is shown by a white cream ring on the top and a coloured milk column below.

Extensive studies at the Veterinary Research Institute, Peradeniya, has proved that by finer modification of the original method<sup>1,3</sup> the Milk Ring Test could be adopted even to test individual cows in a herd. Souring of milk in transit parti-

cularly in the tropics imposes a severe limitation on the usefulness of the test, but this can be circumvented by preserving the milk sample with merthiolate. It was also been determined that the incubation of the test sample for agglutination reaction at room temperature for two hours, gives the same results as at 37°C for one hour within an incubator.<sup>6</sup>

**(ii) Rose Bengal Plate Test (RBPT.)**

The antigen used in the test is prepared at Veterinary Research Institute, Gannoruwa, Peradeniya, from a culture originally imported from the United States of America. It is buffered at pH 3.65 and has a packed cell volume of 8% and is stained with Rose Bengal Dye. The test was performed as described by Alton *et al.*<sup>1</sup>

**(iii) Standard Agglutination Test (SAT).**

The antigen used in the test is prepared at the Veterinary Research Institute, Gannoruwa, Peradeniya, from S 99 culture originally imported from United Kingdom and is standardised against International Anti-Brucella abortus serum. The test was carried out as described by Alton *et al.*<sup>1</sup> and a titre of 1/40 by this method represents 80 International Brucella antibodies per ml of the serum and is considered positive for Brucellosis.

**(iv) The Coombs Test (CT)**

The test determines enhancement of titres above the level obtained in the SAT due to incomplete or blocking antibodies, sometimes present being made agglutinable. The ordinary SAT test is used as the starting point for the Coombs Test. The test was done as originally described by Alton *et al.*<sup>1</sup> If there is enhancement of the titre to the level normally considered positive on the SAT, the serum sample is regarded as positive.

**(v) Complement Fixation Test (CFT).**

Antigen used in this test is the standardised CFT antigen obtained from Central Veterinary Laboratory, Weybridge and the technique of the test is based on the one described by Hill.<sup>4</sup> All samples giving a titre value of 2/4 and over are regarded as positive.

### **3. Results and Interpretations**

Table 1 gives the number of herds tested by MRT against each Milk Board Collecting Centre, and the number of herds found positive in each group. Farmers who do not supply milk to Milk Board are also treated as one group in this survey.

TABLE 1. Number of herds tested by Milk Ring Test

Milk Collecting Centre	Total No. of suppliers	No. of Farms Tested	Total found positive
Narahenpita	41	26	1
Minuwangoda	89	63	—
Meepe	43	31	3
Non-suppliers to Milk Board	—	41	1
Badalgama	118	48	—
Nittambuwa	6	06	—
Attanagalla	98	90	—
	395	305	5

The total number of animals involved in this survey was 1478. This includes the number of animals represented in each bulk milk sample tested at Nittambuwa, Badalgama and Attanagalla centres, i.e. 383 animals and 1095 animals individually tested in farms supplying centres at Narahenpita, Meepe, Minuwangoda and non-suppliers to Milk Board.

The actual location and the number of animals infected are given in Table 2. The infected areas are shown in the map appended at the end of the article.

TABLE 2. Location and number of infected animals

Location of infection	AGA Division.	No. of animals infected
Rajagiriya	Nugegoda	2
Dehiwala	Nugegoda	4
Padukka	Hanwella	2
Meegoda	Hanwella	6
	Total:	14

Data obtained gives the infection percentage as follows:-

Percentage of infected herds	1.6%
Percentage of infected cows	0.9%

#### 4. Discussion

Vaccination of cows with Brucella vaccine has not been practised in this area and therefore the interpretation of titre results on the serum tests are not complicated by this fact. It is to be noted that the MRT and the RBPT could be undertaken even in the field with minimum facilities, whereas the quantitative tests warrant fairly equipped laboratories.

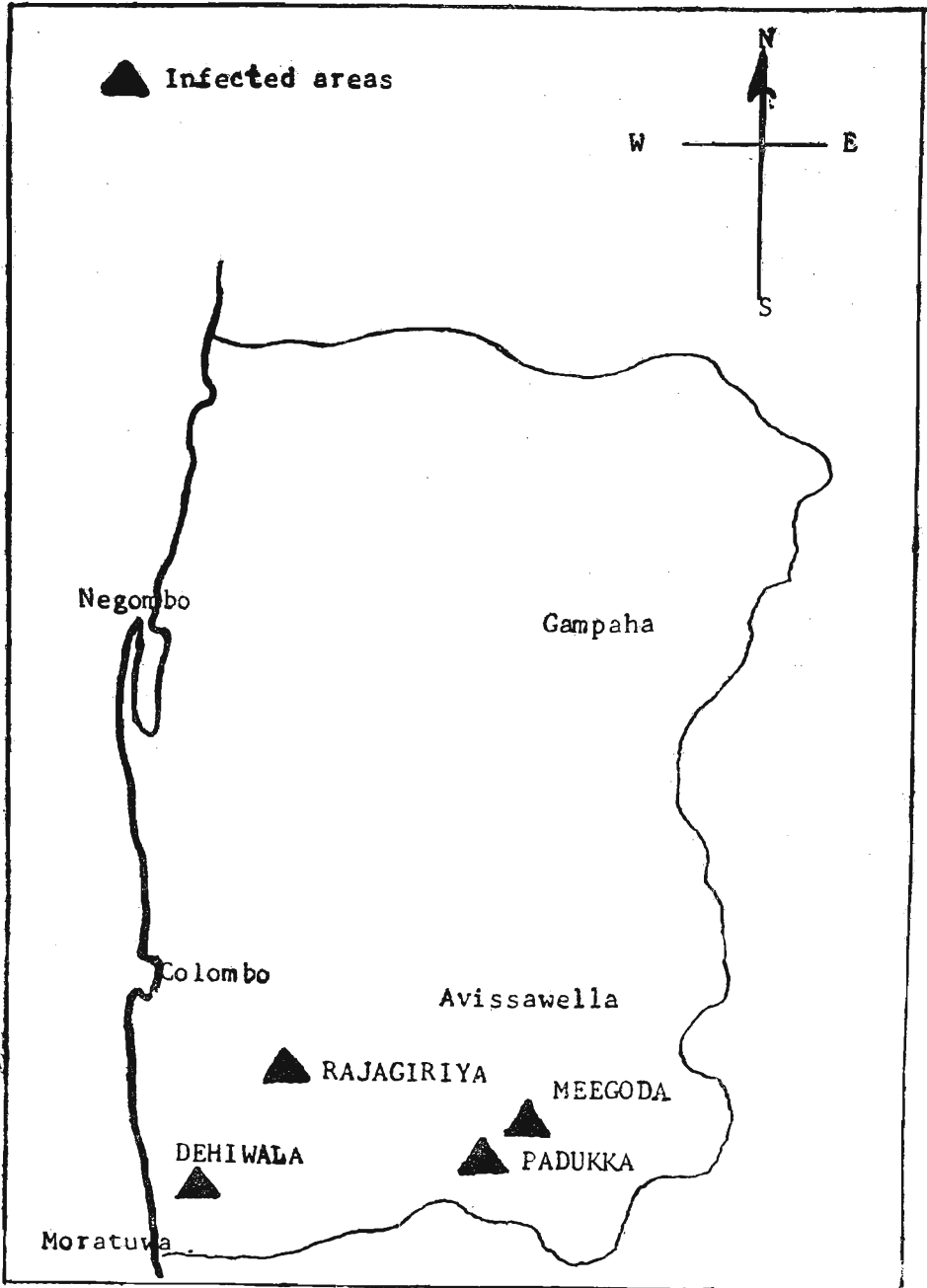
It is noteworthy that in this survey, every single animal found positive on the MRT was confirmed by one of the quantitative tests on the serum.

The six milk collecting centres in the area under survey had a total of 395 milk suppliers, well scattered in the area under survey. Out of this 264 suppliers or 66.8% of the total suppliers in the area were tested. Also, 41 non-suppliers to Milk Board were tested. Therefore it is considered that the percentage of the total herds tested in this survey is representative enough to give a reasonably accurate figure for incidence of the disease in this area.

There should not be any complacency on the grounds that the infection percentage is low, as the situation could very well signify the beginning of a widespread infection.

Private owners are very reluctant to adopt control measures, particularly the procedure of slaughtering of infected animals. Many owners when informed about the prevalence of the infection, resort to sale of the reactor animals to unsuspecting dairymen. This alone contributes to spread of infection.

Experience in other countries have shown that control and eradication are far more practicable when the percentage of infection is low. A scheme for compulsory purchase of infested animals by state for slaughter appears to be an ideal course.



MAP OF THE DISTRICT OF COLOMBO (PRESENTLY, DISTRICTS OF COLOMBO AND GAMPAHA) SHOWING BRUCELLOSIS INFECTED AREAS.

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