# THE SIGNIFICANCE OF THE CARRIER ANIMAL IN THE EPIDEMIOLOGY OF HAEMORRHAGIC SEPTICAEMIA IN CATTLE AND BUFFALOES

by

THULA GAURIE WIJEWARDANA

B.V.Sc. (Sri Lanka)

Veterinary Research Institute, Gannoruwa, Peradeniya

A thesis submitted for the degree of

MASTER OF PHILOSOPHY

in the

Faculty of Veterinary Medicine and Animal Science

University of Peradeniya

October, 1986

# ABSTRACT

Investigations were carried out to study the nature and duration of carrier status of Haemorrhagic septicaemia (HS) in cattle and buffaloes and its possible relationship to the antibody status. These studies were done on animals reared in the HS endemic areas and on those infected experimentally with HS and maintained in isolation in the laboratory premises. Observations made on animals slaughtered at a Municipal abattoir are also reported. Detailed studies were also done on the organisms isolated from carrier animals.

In 3 villages in the HS endemic zone namely, Maeliya, Morotta and Moragollagama, herds of cattle and buffaloes were monitored for their carrier and antibody status for periods of upto 213 days following natural outbreaks of HS. In Maeliya and Morotta, of herd of 25 buffaloes each, 5 (20%) and 3 (12%) were detected as carriers, while at Moragollagama 4 of 10 (40%) buffaloes and 4 of 27 (14%) cattle were found to be carriers. The percentage of animals that developed antibodies in the 3 herds were 88, 92 and 90 respectively. In all these herds the number of animals that showed antibodies was always higher than the number that became carriers. The percentage of carriers detected was highest immediately following an outbreak and the numbers diminished with time.

In the study conducted at the laboratory premises, detailed observations were made on the carrier status of 26 buffaloes and 3 cattle maintained in close contact with buffaloes infected experimentally with HS. In buffaloes the organism was found to appear

in the nasopharynx intermittently. Periods of days between two consecutive isolations seemed to vary and in some instances it was even 59 days. The maximum period for which an animal showed the presence of the organism in the nasopharynx was 215 days post exposure. Autopsies were performed on 8 buffaloes and the organism was isolated from the nasopharynx and 8 other sites namely, parotid salivary gland, mandibular salivary gland, parotid lymph nodes, mandibular lymph nodes, retropharyngeal lymph nodes, haemolymph nodes and spleen. Isolations, however, were not made from axillary lymph nodes, cervical lymph nodes, mediastinal and bronchial lymph nodes, mesenteric lymph nodes and hepatic lymph nodes.

In a study done at the Municipal abattoir, Kandy 494 male adult cattle of mixed breeds originating from HS endemic areas were examined and 76.6% of these were found to possess antibodies to HS. Nasopharynx of these animals were swabbed through the external nares before slaughter and directly after slaughter. The percentage of carriers detected by these two methods were 0.6 and 1.4 respectively. On culture, pasteurellae were isolated from the retropharyngeal lymph nodes of 2.2% of slaughtered animals.

The possibility of goats being reservoir hosts in HS was also investigated. Sixteen goats with no antibodies to HS placed in close contact with buffaloes experimentally infected with HS failed to become clinically infected or to develop antibodies or become carriers. However, when a similar group of goats were infected experimentally with doses ranging from 35 to $10^8$ cattle minimum lethal dose (CMLD's) few deaths due to HS occurred. Of 21 goats that were infected by the subcutaneous route 2 died while 2 of 12

infected by inhalation also died. Of 10 goats infected by the oral route only 1 died. Few goats developed antibodies to the HS organism. The carrier status was seen in few goats and lasted for a maximum period of only 28 days. P. multocida was not isolated from any of the 18 goats that were autopsied. Of 254 goats examined at the Municipal abattoir, Kandy, 26.7% showed antibodies against HS, but no isolations were made either from nasopharynx or from the retropharyngeal lymph nodes of these animals.

A total of 40 isolates of P. multocida from carrier animals were subjected to a complete biochemical and serological study. The isolates from live carrier animals with a history of recent exposure to HS showed a remarkable uniformity in their biochemical and serological characters. A significant number of isolates from the abattoir animals, on the other hand showed variations. A few representative isolates which were subjected to pathogenicity studies in buffaloes and in mice proved that they were as pathogenic to mice as those obtained from HS outbreaks and were capable of producing the typical disease syndrome in susceptible buffaloes.