

## Sarcosporidiosis in Goats in Ceylon

by

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The presence of *Sarcocystis* infection among buffaloes has been known to butchers from early times (Willey, Chalmers and Philip, 1904). However Shipley (1903) was the first to record its presence here. Willey *et al.* (1904) studied its distribution in buffaloes from various parts of the country and found a high rate of infection in animals from Tamankaduwa, although the number of animals examined was small. Wettimuny and Abeysena (1966) extended the area from which this parasite has been previously recorded in buffaloes. Successive administration reports of the Chief Veterinary Surgeon of the Colombo Municipal Council gave the presence of this parasite as reason for condemning carcasses of slaughtered buffaloes in the Municipal abattoir.

Although Willey *et al.* (1904) claimed that neat cattle were not infected with *Sarcocystis*, Amarasinghe (1951, 1953a, 1953b) and Dissanaikie and Jayasuriya (1959) were able to detect such infections. Wettimuny and Abeysena (1966), while reporting the presence of infections in neat cattle, were able to locate the places of origin of the infected animals.

The above studies were made on material obtained at meat inspection at the Colombo Municipal abattoir. No systematic study has been undertaken to evaluate the size of the problem in cattle, other domestic or wild animals. A study was therefore undertaken for the purpose of examining the nature and extent of this parasitic infection in Ceylon with a view to adopting better diagnostic and control methods. This report is the first of a series of such studies.

### MATERIALS AND METHODS

The goats used in this study were those used in the preparation of anti-rabies vaccine. They were supplied to the Institute by a contractor who informed us that most of them were obtained from Jaffna. The goats were decapitated for harvesting the brains for the preparation of anti-rabies vaccine and the carcasses were discarded. The anterior ends of the oesophagi of some of these goats were dissected out and examined macroscopically for signs of infection with *Sarcocystis*. The muscles surrounding this area were also examined macroscopically for such infections. About 6 cm. lengths of oesophagi were fixed in 10% formol-saline for histological studies.

A centimeter long piece of the oesophagus from each animal was taken for further processing. Paraffin wax transverse sections of oesophagus of  $6\mu$  thickness were made, using standard techniques. Five slides containing 5 sections each from various levels of the block were selected for examination after staining in haematoxylin and eosin. The slides were scanned under a low power magnification (X60) and when an infection was detected it was confirmed under the high power and the oil immersion when necessary.

A few oesophagi from goats slaughtered at the Colombo Municipal abattoir were also examined in a similar manner.

#### RESULTS

A total of 105 goats was examined during a period of 6 months. No macroscopic signs of infection were observed in either the oesophagi or the muscles of the neck. On microscopical examination of the sections of the oesophagi, 22 goats were found infected while 83 goats were uninfected giving a percentage of infection of 20.9. Of the 22 goats infected sarcocysts were found in all 5 slides of the oesophagi in 10 goats, in 4 slides in 3 goats, in 3 slides in 4 goats, in 2 slides in 2 goats and only in 1 slide of the oesophagi in 3 goats. Of the 18 oesophagi from the Colombo abattoir 7 goats were found to be infected, with *Sarcocystis* in all 5 slides in 2 goats, in 4 slides in 2 goats, in 2 slides in 1 goat and in 1 slide in 2 goats giving a percentage of infection of 38.9.

Special mention must be made of the fact that in none of the slides were any forms seen with compartments as described for typical *Sarcocystis tenella*.

#### DISCUSSION

The first record of *Sarcocystis* in goats was made by Neveu-Lemaire in 1912 (see Neveu-Lemaire, 1943) under the name *S. moulei*. He differentiated it from *S. tenella* of sheep by the latter's larger size, thicker cuticle and the presence of striations. However, these characters are variable even in the same species of parasites developing in different hosts (Levine, 1961). They are also dependant on the age of the parasite and the site of infection (Scott, 1943). Furthermore, experimentally it has been shown that *Sarcocystis* is not very host specific. Therefore the species of *Sarcocystis* found in goats is considered as *S. tenella*, the parasite described from sheep.

Although Reichenow (see Levine, 1961) considers it uncommon in goats, Moulé (see Neveu-Lemaire, 1943) found 33% of fat goats and 46% of emaciated goats infected while Eisenstein and Innes (1956) found infections common in goats. The incidence of sarcosporidiosis in goats in Ceylon was about the same as reported elsewhere. The infections in animals could only be detected by the tedious process of examining microscopic preparations. The possibility of some of the infections going undetected cannot be excluded. The distribution of parasites in the slides examined by us support this belief.

From the epidemiological point of view it is important to ascertain the relative transferability of the various species recorded. Records of human infections are far between and scanty, most being discovered at post mortem examinations. However, no systematic survey of its incidence in man has been carried out and hence most of the infections would most likely go undetected. *Sarcocystis* infections in carnivores were considered rare till Eisenstein and Innes (1956) showed that it was common at least among cats. It has also been shown to be common in monkeys. Of the species tested for host specificity *Sarcocystis tenella* of sheep was shown to infect such widely different hosts as the mouse, guinea pig, chicken and duck (Levine, 1961). Considering the very high rate of infection prevalence in domestic animals like sheep, pigs etc. and the fact that the faeces of infected sheep contained an infective stage which transmitted the infection to new sheep (Scott, 1943) it is surprising that human infections detected were few. It is possible that since no systematic survey has been carried out to detect such infections in man, they would have gone undetected. The parasite may also not infect man. The development of more sensitive diagnostic facilities would throw more light on the epidemiology of the disease. Careful studies should be carried out among those closely associated with animals. From the epidemiological point of view, infected carcasses that escape detection at meat inspection would not present a hazard even if man could be infected with animal species as meat is thoroughly cooked before consumption in this country.

#### SUMMARY

Out of a total of 105 goats examined from those used in the preparation of anti-rabies vaccine, 22 animals were found infected with *Sarcocystis tenella* giving a rate of infection of 20.9%. Of 18 goats from the Colombo Municipal abattoir examined for sarcocysts, 7 were positive giving a percentage of infection of 38.9%. The significance of these findings are discussed from the epidemiological point of view.

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