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STUDIES ON THE BACTERIOLOGY OF *ESCHERICHIA COLI* STRAINS FROM CALVES (*Bos taurus*) AND BUFFALO CALVES (*Bos bubalus bubalis*) IN SRI LANKA WITH SPECIAL REFERENCE TO THEIR ENTEROTOXIN PRODUCTION AND ANTIBIOTIC SENSITIVITY PATTERNS

by

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SUMMARY

1. 273 strains of E.coli were isolated from faecal or intestinal contents from calves and buffalo calves housed in farms in the dry and wet zones of Sri Lanka.

2. The ability to produce toxin(s) and the relationship of these toxin(s) producing E.coli strains to diarrhoeal disease of calves and buffalo calves were studied.

2.1 48 strains of E.coli produced Vero cytotoxin (VT). 28 per cent of 134 diarrhoeic calves and buffalo calves yielded VT producing strains of E.coli, but such strains were recovered only from 5 per cent of 87 apparently healthy normal calves. These differences were statistically highly significant ($P < 0.001$). The VT produced by 35 strains of E.coli were antigenically related to the VT produced by human E.coli strains when tested by neutralization of toxin with Shiga antitoxin, but the VT produced by 5 strains were distinct.

This study shows for the first time an association of VT producing E.coli with diarrhoeal disease of calves and buffalo calves and an antigenic relationship between Shiga toxin and VT of E.coli isolated from calves and buffalo calves.

2.2 The ST producing strains of E.coli were isolated from 40 (15 per cent) of 273 animals in this study. 24 (18 per cent) of 134 diarrhoeic and 6 per cent of 87

apparently healthy calves and buffalo calves yielded ST producing E.coli strains. These differences were statistically significant ($P < 0.05$).

2.3 LT producing E.coli strains, though present in 11 per cent of the 273 isolates, were not associated with calf and buffalo calf diarrhoeal disease, in the present study.

3. When the 273 isolates of E.coli were tested for their pathogenicity to adult mice, the results revealed that 100 (74 per cent) of 134 diarrhoeic isolates and 40 (46 per cent) of the 87 isolated from apparently healthy calves and buffalo calves were pathogenic. These differences were statistically significant ($P < 0.0001$).

4. Serotyping of the isolates with twelve antisera showed that although some isolates could be serotyped with these antisera the majority of the isolates gave either cross reactions or no agglutination. It is concluded that there was a multiplicity of O antigens amongst E.coli isolates from calves and buffalo calves in Sri Lanka.

5. The antibiotic sensitivity patterns of the 273 isolates of E.coli revealed that the maximal resistance was recorded against bacitracin (100 per cent), followed by polymixin B (99 per cent), erythromycin (98 per cent), penicillin (98 per cent), chloramphenicol (97 per cent), ampicillin (88 per cent), neomycin (48 per cent) and tetracycline (42 per cent).