

Salmonellosis in Animals and Birds in Papua and New Guinea.

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ABSTRACT.

All salmonellae strains isolated at the Department of Agriculture veterinary laboratory, Port Moresby, are recorded for the period August, 1964, to July, 1966. A remarkably small number of clinical cases occurred, the most significant losses being in poultry enterprises. Isolations from clinical cases totalled seven and from symptomless carriers 12.

INTRODUCTION.

THIS paper is a continuation of the record, which was started in July, 1962, of Salmonellae strains isolated from birds and animals in Papua and New Guinea (Rampling and Egerton 1966). This record covers the period from August, 1964, to July, 1966, and includes a small survey on the carrier rate of Salmonellae by dogs and cats in the Port Moresby District.

MATERIALS AND METHODS.

Cultures were made from faeces, small intestine contents and organs of clinical cases and survey material consisted of faeces and pooled mesenteric lymph node, liver, spleen and bile from each post mortem.

Material was cultured directly onto desoxycholate citrate agar and also enriched in tetrathionate and selenite or Hajna's GN broth.

To ensure maximum cover of the different Salmonellae serotypes, two different enrichments were used for each specimen and these were sub-cultured onto desoxycholate citrate agar at 24 and 48 hours respectively. All suspect colonies were isolated on tryptose agar and submitted to standard biochemical tests. Those colonies which gave the biochemical reactions for the genus *Salmonella* were confirmed and grouped according to somatic antigens by slide agglutination tests using standard Commonwealth Serum Laboratory's sera. The definitive typing was carried out by the Institute of Medical and Veterinary Science, Adelaide.

DESCRIPTION AND DISCUSSION OF ISOLATIONS.

Cow—*S. breukelen*. This organism was isolated in mixed culture with *Staphylococcus aureus* from a cow with clinical mastitis.

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Salmonellae may be excreted in the milk during acute septicaemic infection or in cases of localized udder infection. The organisms may also enter milk due to faecal contamination of the outside of the udder by a carrier animal. In the case under discussion a specimen of milk was taken with aseptic precautions and the isolated organisms must have come from inside the udder. The animal was in good condition and showed no signs of general infection so it must be concluded that the mastitis was caused by mixed *Staphylococcus* and *Salmonella* infection.

Salmonella infection of the udder seems to be fairly rare and there are few records in the literature of *Salmonella* mastitis, however, Pullinger and Millar (1945) describe an epidemic of milk borne food poisoning which was traced to a cow with *Salmonella* mastitis. The dangers of food poisoning in a case of *Salmonella* mastitis are very real in this country where pasteurization is not practiced.

Horse—*S. anatum*. *S. anatum* was isolated from the visceral organs of a horse which was found dead in the Markham Valley area near Lae. Several other horses in contact with this one showed signs of the "Markham Valley Colic" syndrome which occurs frequently in this area. Faecal specimens were taken from one animal which had recovered and from eight others in contact but with no signs of sickness, however, no Salmonellae were isolated.

Salmonellosis in horses is frequently associated with colic or gastro-enteritis but in the majority of cases the Salmonellae only play a secondary role in the infection (Buxton 1957) also *S. anatum* is quite commonly isolated from sporadic cases of Salmonellosis in horses (Buxton 1959).

In this case it seems likely that the Salmonellosis was a secondary infection which overcame an animal already weakened by colic. The cause of the "Markham Valley Colic" syndrome remains a mystery.

Chickens—S. kottbus. This organism was isolated from three batches of chickens which were imported from a Queensland hatchery. Two batches were sent to Madang and a third batch was sent to the Animal Quarantine Station, Kila Kila at Port Moresby. Heavy losses were experienced in the first batch which went to Madang and these were completely destroyed in an attempt to stop cross infection on the property. The second batch arrived about six weeks later and was housed in a separate shed from the previous batch, however, losses occurred once more. Only one death occurred in the chickens which were sent to Port Moresby and arrived at the same time as the first Madang consignment, however, *S. kottbus* was also isolated from this case.

In all cases the signs of sickness were weakness and paralysis of the legs before death which occurred during the first three days of life.

A thorough investigation of the hatchery was carried out by the Queensland Department of Agriculture but it was not possible to trace the source of infection or to prove that it had occurred at the hatchery.

Salmonella newington. A 95 per cent. loss in chickens imported to a property near Port Moresby was caused by this serotype. The bulk of the losses were experienced at the age of three to five days. The clinical picture was that of acute toxæmia, as seen in pullorum disease, but there was little evidence of diarrhoea.

Once more the Queensland Department of Agriculture made a thorough investigation of the hatchery concerned but *Salmonella newington* has never been recorded in chickens in Queensland and it did not seem that the infection could have been contracted at the hatchery. Also part of the same batch that went to Port Moresby was sent to Darwin where no losses were experienced.

Contamination of the Port Moresby premises by rodents, insects, etc., was suspected and a follow-up survey was carried out on rats and mice caught in the area, however, no further

RESULTS.

Table 1.—Isolations from clinical cases of Salmonellosis.

Group.	Serotype.	Host.	No. of cases.	Location.
C	<i>S. kottbus</i>	Chickens	2	Madang, Port Moresby.
C	<i>S. breukelen</i>	Cow	1	Lae.
D	<i>S. pullorum</i>	Chickens	1	Lae.
D	<i>S. enteritidis</i>	Duck	1	Lae.
E	<i>S. anatum</i>	Horse	1	Markham Valley, via Lae.
E	<i>S. newington</i>	Chickens	1	Port Moresby.

Table 2.—Isolations from Animals showing no clinical signs of Infection.

Group.	Serotype.	Host.	No. of isolations.	Location.
C	<i>S. virchow</i>	Deer	5	Port Moresby.
		Dog		
C	Not identified	Cat	1	Port Moresby.
D	<i>S. enteritidis</i>	Dog	3	Port Moresby.
E	<i>S. anatum</i>	Dog	1	Port Moresby.
E	<i>S. new brunswick</i>	Dog	1	Port Moresby.
E	<i>S. weltevreden</i>	Dog	1	Port Moresby.

isolations were made. The remainder of the flock was sacrificed and thorough disinfection of the premises was carried out. No further outbreaks have taken place since then.

Salmonella pullorum. A 50 per cent. loss in chickens imported from Queensland to Lae as day-olds was found to be due to *Salmonella pullorum*. The losses occurred at about one week of age and it seems likely that, once more, the infection was picked up after arrival in the Territory.

Ducks—S. enteritidis. This serotype is fairly commonly isolated from ducks although it is the first time that it has been recorded in birds in the Territory. It was isolated from a duck which died at about three months of age. There was a history of losses in ducks on this property and also a number of losses were occurring in young chickens. It seems likely that this serotype was widely disseminated about the environment of the property.

Frozen deer meat. Locally killed deer are now being deep frozen and exported for human consumption. Representative samples are taken from the batches before export and are tested for Salmonellae. Out of 21 specimens examined, one isolation, *S. virchow*, was made. This particular batch of meat was condemned.

Dogs and Cats in Port Moresby area. A small survey was carried out on dogs and cats which were presented for post mortem over the four months January to May, 1966. None of these animals showed any clinical signs of disease. Faeces and pooled mesenteric lymph node, liver, bile and spleen were enriched in tetrathionate or selenite broths and Hajna's GN broth and plated at 24 and 48 hours onto desoxycholate citrate agar.

A total of 29 dogs and 24 cats were tested. Ten isolations were from dogs, one dog carrying two serotypes, *S. virchow* and *S. enteritidis*, and only one isolation of group C *Salmonella*, which unfortunately was not typed, was made from the cats.

An unexplained but interesting factor was that all of the isolations were during the month of January, no further isolations being made in February, March or April. Almost all of the animals were owned by Europeans so possibly one particular batch of imported canned pet food could have been incriminated.

GENERAL DISCUSSION.

Several new strains of Salmonellae have been added to the list of species isolated in the Territory but the record from the past two years confirms our previous opinion that Salmonellosis is not of great economic significance in livestock enterprises here (Rampling and Egerton 1966). The most important losses have been experienced by poultry farmers when *Salmonella* infection has occurred in stock during the first week of life. In none of the cases listed was it possible to prove that the infection had been imported with the chickens and the danger of *Salmonella* infection should be borne in mind in the management of Territory poultry farms.

SUMMARY.

A record of Salmonellae diagnosed in animals and birds in the Territory has been continued from the period August, 1964, to July, 1966. Seven isolations were made from clinical cases of Salmonellosis and three of these strains had not previously been isolated from animals or birds here. Twelve isolations including one new strain were from carriers showing no sign of infection.

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