

## General Discussion

**Chairman: Snowden, W.** (Australia): Before we proceed to the general discussion, I would like to show a few slides and make a brief presentation on an outbreak of vesicular disease of unknown etiology which affected recently a pig farm located in Tasmania. In a piggery where animals are usually fed garbage, 70% of the animals developed a vesicular disease involving only the dorsal aspect of the nose. No other clinical signs were observed. The animals were slaughtered chiefly for fear of foot and mouth disease. Bacteriological, virological studies as well as serological and transmission tests failed to uncover any pathological organism.

I would like to suggest that the general discussion be divided into three areas. (1) Comments could be added so as to make a contribution to the diseases already discussed. (2) Comments could be made on diseases which have not been taken up in the symposium but which are deemed important. (3) Areas which require cooperation between various countries so as to promote and improve disease control could be discussed. We shall now consider the first part of the discussion. Is there any comment?

**Watanabe, M.** (Japan): I would like to emphasize how informative the symposium was and, in particular, how much I appreciated having the opportunity of learning more about the relation between seasonal variations and the severity of pasteurellosis. In this regard, I would like to mention that Professor Kumagai of Sendai University has demonstrated that, in keeping in mind with the circadian biorhythms of mammals and birds, the peak of cortisone secretion is attained early in the morning in man whereas the number of lymphocytes is lowest at that time. The implications of such findings are obvious when it comes to determine which is the best time for vaccination. Also it appears that an infection contracted in the morning is likely to be more severe than in the evening.

**Chairman:** We should now proceed to the second part of the general discussion. Are there any diseases which you consider to be very important and which have not been covered in the presentations?

**Srihakim, S.** (Thailand): In Thailand, there is a disease affecting buffaloes and Brahman cattle in the dry season. The animals have high fever and show excessive salivation and lameness. They usually recover after 2-3 days upon the administration of antibiotics, anti-histamine drugs and fluid therapy. Some die in displaying respiratory signs, mostly pneumonia. The diagnosis has not been established although the possibility of haemorrhagic septicaemia has been considered along with cassava toxicity or bovine ephemeral fever. Has anyone seen such a condition?

**Chairman:** Bovine ephemeral fever is usually not associated with clinical disease in buffaloes in Australia.

**Joseph, P.G.** (Malaysia): In Malaysia we have a low incidence of Johne's disease in a couple of farms. We combine the complement fixation test (CFT), fecal smear and culture to make the diagnosis and we have found that where the CFT (extracted antigen) and microscopic examination are positive, the culture is positive in 95% of the cases. What is your experience with the diagnosis of this disease as we have noted that often the CFT was unreliable by itself and the culture requires 3 months? We have heard of new techniques such as lymphocyte migration test.

**Yugi, H.** (Japan): In Japan we have also encountered such cases and other immunological methods are being investigated presently as the CFT does not always enable to detect sub-clinical cases.

**Chairman:** In Australia the disease occurs in the Southern part of the country. The diagnosis and control are both most difficult.

**Joseph, P.G.** (Malaysia): Very recently in Malaysia we have noted the existence of *Salmonella dublin* in cattle. The first report dates back to 1974 when the organism was isolated from imported buffaloes. The infection in calves killed the animals and in two cases joint lesions were observed. *Salmonella dublin* has also been isolated from a goat.

**de Alwis, M.C.L.** (Sri Lanka): In Sri Lanka in the 1950s *Salmonella dublin* was an important

cause of mortality in young calves following an enteric syndrome. The condition was particularly prevalent among the temperate breeds and their crosses. At that time we started using a vaccine. After about 10 years of its use the problem could be overcome and the incidence of *Salmonella dublin* is now very low. When one considers the causes of calf mortality it appears that there is a shift from mortality in the pre-weaned calves due to enteric disease (*S. dublin*) to respiratory diseases in the post-weaning period (3 - 6 months). Also *Salmonella dublin* causes abortion in cattle.

**Sato, S.** (Japan): In Japan the first case of *S. dublin* was observed in 1975 in calves with diarrhea and septicemia in a farm located in the Western part of Japan. Since then 5 other farms have been affected by the disease and in 2 of these farms abortion was observed. Control was performed by separating the infected animals from the healthy ones, disinfection of the premises and administration of antibiotics (Chloramphenicol) and sulfamides. Antibiotics were given repeatedly for 3 consecutive days at 10-day intervals. After treatment fecal examination became negative. Most of the young calves recovered unlike the adult cattle which even after a 2-month treatment had to be disposed of.

**Fujikura, T.** (Japan): On the occasion of my visits to the Southeast Asian countries I have been impressed by the attention given to leptospirosis of livestock. Countries like India, Indonesia and Sri Lanka have established diagnosis and research centers for leptospirosis. A leptospirosis reference laboratory sponsored by FAO/WHO has been set up in Brisbane for the preparation of specific anti-sera and the distribution of standard strains. In Japan, leptospirosis is a minor problem.

**Carlos, R.S.** (Philippines): In the Philippines we do not have any leptospirosis reference center but we are undertaking research on isolation and testing (agglutination lysis test). About 29 serotypes are being used. As for the isolates, *Leptospira manilae* has been isolated from rats, whereas one isolate has been recovered from a shrew and two isolates from pigs, namely *Leptospira pomona* and *Leptospira pyrogenes* (Dr. Topacio). The incidence in pigs using the microscopic agglutination lysis is about 44% and the predominant serotype is *Leptospira pomona*. In cattle (*Leptospira hardjo*) the incidence is about 22%. Leptospirosis is a major problem in the Philippines and abortion cases are more often attributed to leptospirosis than to brucellosis.

**Joseph, P.G.** (Malaysia): The microscopic agglutination test (MAT) has only been made available recently (1977) although leptospirosis is known to affect wild and domestic animals. The *Hebdomadis* serogroup and the *hardjo* serotype are the most common *Leptospira* in cattle. The next common serogroups are *Tarasovi* (*hyos*) and *pomona*. We have so far been unable to isolate *Leptospira* on culture although the organisms have been shown by special histopathological staining technique and by dark ground microscopy. We have recently started a *Salmonella-Leptospira* survey in house shrews and have detected MAT titres against *pomona* and *pyrogenes* serogroups in shrews. Incidentally, 80% of the shrews harbour *Salmonella* pathogenic to man.

**Hashimoto, K.** (Japan): Are you using *S. dublin* vaccine for the prevention of *S. dublin* infection in cattle?

**Joseph, P.G.** (Malaysia): No, we have not used *S. dublin* vaccination but may consider its use if the infection in cattle should become widespread.

**Chairman:** We should now start the third part of the general discussion which could include appropriate comments on areas in which people believe that additional work is required and collaboration between the various countries would be important.

**de Alwis, M.C.L.** (Sri Lanka): With regard to haemorrhagic septicaemia (HS) there appears to be a great deal in common in the situation of the disease both in India and in Sri Lanka. Two main areas could benefit from investigations on a collaborative basis. (1) The carrier state which seems to be short-lived in the naso-pharynx. Indeed where does the organism persist during the long intervals between outbreaks and are there other sites where the organism is carried? (2) As regards the vaccines, there should be some standardization in vaccine production, namely concentration of the organism per dose of vaccine, strain used, nature of the adjuvant used, etc. The methods of evaluation for potency should also be standardized. I believe that some type of collaboration between the different countries in the region is desirable to carry out field trials under standardized

conditions. I would like to add that these problems will be discussed at the forthcoming Workshop on Haemorrhagic Septicaemia which will be held in Sri Lanka in December. Besides the use of the killed adjuvant and live vaccines about which we had some information in the symposium, I am aware that the Wellcome Laboratories in the U.K. are experimenting with a vaccine incorporating purified capsular extracts. I understand that Dr. Sudana has been associated with trials using this vaccine.

**Sudana, G.** (Indonesia): I can only mention preliminary results as field results have not yet been documented with that vaccine which incorporates capsular antigen at three concentrations. Protection is about 60% and sufficient for cattle to be challenged 21 days after vaccination (challenge test: Standard British Veterinary Codex). The vaccine appears to be less satisfactory in buffaloes than in cattle.

**Gupta, B.K.** (India): I am in agreement with the comments made by Dr. de Alwis. It would be desirable to establish a center in Southeast Asia where collaborative studies could be carried out to lay down standards for the production of vaccine (as regards the adjuvant for example) and for assays including standard tests in mice. Also, it would be important to carry out collaborative studies on the causative organism, serotyping (somatic and capsular) and on isolates, along with studies on the carriers and other reservoir animals. Collaborative field trials should be conducted to evaluate the advantages of the use of multi-emulsion vaccine as well as the potency of vaccines in different countries.

**Srihakim S.** (Thailand): In Thailand, I believe that before setting up a collaboration with other countries it is first necessary to improve the regulations relating to the methods of production and control of vaccines as well as their use along with promoting the education of the farmers.

**Koh, J.G.W.** (Singapore): In the field of control of hog cholera (HC) there is room for regional cooperation. (1) To compare the pathogenicity of various HC isolates from different countries and study the efficacy of different HC vaccines against these isolates. (2) To produce high titer standard fluorescent antibody conjugates for the rapid diagnosis of HC by a more advanced laboratory so as to promote similar studies in less developed laboratories.

**Rahman, A.** (Malaysia): There is a need for collaboration between countries in the region although often some countries are slow to take advantage of the programs available to carry out collaborative work. There is a need for the identification of specific fields and for transfer of specialised technology in diagnosis and research.

**Hanafi, M.** (Indonesia): There is a need for establishing a cooperation between the countries of Southeast Asia to control the biological products such as vaccines and drugs which are produced in the country or are imported. It would be useful to establish an assay laboratory for regional purpose so as to alleviate the financial constraints experienced by the developing countries of this region and to provide the necessary expertise and facilities. I would like to ask Dr. Snowdon whether it would be possible for the Australian authorities concerned to vaccinate against babesiosis the cattle imported by Indonesia for breeding purposes, as these animals often develop the disease in Indonesia.

**Gupta, B.K.** (India): As far as the control of biologicals is concerned, in India, since 1969, the veterinary biologicals have been brought under control of the Drugs Act. All the manufacturing units have to fulfil certain conditions to be licensed for the production of biologicals. The act also lays down the standards for many of the drugs. All the batches of different products are assayed in the production laboratory and the samples are tested at the National Control Laboratory located at the Division of Standardization, IVRI. A need for a regional control laboratory for the Southeast Asian countries is acutely felt.

**Gatapia, S.L.** (Philippines): As regards haemorrhagic septicaemia, I would like to have the opinion of Dr. Namioka about the vaccines in view of his experience in this field of study.

**Namioka, S.** (Japan): As you already know, in Japan, haemorrhagic septicaemia (HS) has been eradicated. As far as the vaccine is concerned, I would like to recommend the use of the attenuated live vaccine as the protection mechanisms of HS depend on cellular immunity (T cell

lymph cell mediated) rather than on humoral immunity. In this respect, cooperative studies should be initiated so as to investigate possible side-effects.

**Chairman:** Before closing the general discussion, I would like to emphasize certain aspects relating to the prevention and control of infectious diseases of livestock. (1) Considerations on the socio-economic situation of a country and understanding of the attitude of the people are most important as the knowledge of the social conditions of an area can be used for the benefit of prevention and control of livestock diseases. For example, I would like to make a reference to the successful eradication of foot and mouth disease in Indonesia which could be brought about by the social structure of the villages. It is indeed important to educate the people so as to make them aware of the need to carry out the measures recommended, for their own benefit. (2) The recognition of the diseases must be done in the field by trained and experienced veterinarians. In addition, good diagnostic facilities must be available. As far as the prevention and control of the diseases are concerned, several areas must be considered, for instance the need for improving the hygiene of the animals through the education of the rural population. (3) Vaccines must be tested for safety and efficiency particularly in areas where there is some resistance to the use of vaccination, as vaccination must be applied in the field.