

Report on Purdue Conference on Mucosal Disease

SINCE 1946 A NUMBER of diseases of cattle with many similar clinical and pathological manifestations have been reported from various parts of the United States. In general they are characterized by a febrile reaction, respiratory signs, ulcers and erosions of the oral and intestinal mucosa and diarrhea. The diseases in this group have been named virus diarrhea (New York), mucosal disease (Iowa), virus diarrhea (Indiana), necrotic rhinitis and tracheitis (Colorado), and influenza-like disease (California). Although these diseases have dissimilarities, some investigators feel they have certain symptoms and lesions suggestive of rinderpest.

One or more of these diseases have been observed in 20-24 states. The reported incidence has varied from sporadic appearances to outbreaks of epidemic proportions. The reported mortality has varied from 0-50%. Probably the most serious aspect of this disease is the economic loss, resulting from the marked loss of body weight and condition that occurs in the non-fatal cases. The total economic losses sustained as a result of deaths from these diseases has undoubtedly been very great for the country as a whole.

Although it is imperative that the causative agent be isolated for each disease,

it is also important to determine if the etiologic factors are the same because of the similarity of these conditions. This can best be accomplished by a cooperative approach, for these reasons. (1) The problem is exceedingly complex and requires the application of many different fields of investigation, ie. immunology, virology, pathology, physical chemistry, etc. (2) Since all of these diseases as described have not occurred in all areas of the country, adequate observations cannot be made by any one laboratory. (3) The immensity of the problem at present physically precludes any one laboratory from satisfactorily making the necessary comparisons of the various diseases in this group.

Only with a proper understanding of the etiological agents and the pathogenesis of these diseases can adequate means of diagnosis, prophylaxis and control be developed to prevent the losses presently occurring. In addition, because of the constant threat of the introduction into this country of exotic diseases of a similar nature such as rinderpest, it is doubly important that these diseases be thoroughly studied. Unless adequate means of differentiation between rinderpest and these indigenous diseases are established, the confusion that now exists might permit such

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purulent inflammation of the bladder, ureters, and pelvis portion of the kidneys. It occurs chiefly in cows but has been found in horses, sheep, swine and dogs. The infectious agent responsible for pyelonephritis is *Corynebacterium renale*. The organism is spread by contact with infected animals via the urogenital tract.

Probably the most important diagnostic symptom of the disease is hematuria. This condition is caused by an increased permeability of the blood vessels and rupture of the capillary walls due to necrosis. The animal is restless due to the inflammation in the kidneys, ureters, and bladder and thus the swelling exerts pressure on the sensory nerve. There is a straining and frequent urination due to the large amount of urine formed. This increased amount of urine results in damages to the glomeruli and tubules and also because of irritation produced by the urine in the inflamed bladder. Severe anemia is produced as a result of loss of blood by way of the urinary tract. The circulatory and respiratory systems have an increased load placed upon them. This, coupled with the effect caused by toxic products from necrosis and suppuration, produce myocardial degeneration and final collapse of the heart with death by asphyxia. Death may be sudden if there is a rupture of the clots found in the ureters of bladder.

Hemoglobinuria Associated with Leptospirosis

One of the important diseases in which hemoglobin occurs in the urine is Leptospirosis and it can be used as an example to describe one mechanism by which a disease process can cause hemoglobinuria.

After the leptospira organism enters the respiratory tract it enters the blood stream and produces a septicemia and fever. Hemolysis of the erythrocytes is produced and this is thought to be caused by toxins which are liberated by the leptospira. The organism then localizes in the kidney where it produces interstitial nephritis. Reinhard has divided the disease into four stages: (1) incubation stage (2) septicemic period (3) hemolytic stage (4) interstitial-nephritis. The hemolytic period

may last for several weeks. This is the cause of the hemoglobinuria which may be an important symptom of the disease. Obviously, the hemoglobinuria may result in anoxemia which is responsible for many of the lesions observed in a case of leptospirosis. The urine varies in color from a light pink in the mild cases to a deep reddish-black in severely infected animals. In severe cases death may occur by the second day and is frequently attributed to massive erythrocyte destruction and the resulting fatal anoxemia.

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an exotic disease to gain a foothold in this country with disastrous results to our entire cattle industry.

The following objectives were set up for future work on this problem. (1) To describe or classify each of these diseases

by their clinical manifestations and pathological changes. (2) To determine the etiological agent for each of these diseases and possible relationships between them. (3) To determine by standard epidemiologic means the geographic distribution, incidence and importance of these diseases in the cattle population. (4) To develop adequate means of prevention and control of these diseases.

The procedure to be used in attaining these objectives are as follows: (1) Sufficient numbers of natural and experimentally induced instances of each of these diseases should be subjected to critical clinical and clinical-pathological examinations. Complete gross and histologic pathological studies should be made on natural and experimental cases during the course and at the terminal stages of the disease. This will be necessary before adequate comparisons can be made between these various similar diseases. (2) The first step in this procedure must be to determine by proper means whether the disease is transmissible. If the causative agents are infectious in nature adequate comparisons as to their relationships should be determined by acceptable standard procedures. These procedures would include cross-protection tests, serum neutralization tests and other serological procedures. Studies of the physical and chemical properties of the agent should be included. (3) After the etiologic agents have been determined and serological techniques have been developed, valid surveys can be instituted to determine the extent and incidence of the various diseases in this group. This will permit a critical evaluation as to the economic importance of these conditions. (4) With an understanding of the causative factors adequate control measures may be developed by the proper use of specific vaccines or other biological or pharmaceutical preparations.

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Dykstra Veterinary Hospital

The new Dykstra Veterinary Hospital at Kansas State College has been named in honor of Dr. R. R. Dykstra, deam emeritrius of veterinary medicine. The dedication ceremony for the modern \$575,000 two story native limestone structure will take place on June 2, 1955, in conjunction with the veterinary college's Golden Anniversary. Besides providing facilities for small and large animals there is a large amphitheater with a seating capacity of 285. **Dr. Dykstra, a member of the graduate class of 1905.**

THE EFFECT OF TRANSMISSIBLE GASTROENTERITIS ON THE METABOLISM OF BABY PIGS. The effect of transmissible gastroenteritis infection upon feed consumption, water, nitrogen, sodium, and potassium balances and blood constituents of 6 young pigs was investigated. Six pigs were maintained as noninfected controls. The pigs were 26 days of age at the time of infection. The incubation period as measured by the appearance of vomition or diarrhea varied from twenty-four to seventy-two hours. All the infected pigs showed symptoms of the disease. The pigs lost an average of 4 per cent of their body weight during the last two 24-hour periods. Feed consumption, weight gain, blood glucose, and the amount of water, nitrogen, sodium, and potassium retained were decreased by the infection. Following infection the fecal water was increased forty-fold and hemoglobin values were slightly increased. There was no elevation in the average temperature of the exposed pigs. The heart, liver, kidney, spleen, and intestine weights were calculated as percentage of body weight and comparison of these values for the infected with noninfected pigs revealed no differences.

[Reber, Elwood F., PhD.; Whitehair, C. K., D.V.M., Ph.D. The effect of transmissible gastroenteritis on the metabolism of baby pigs. American Journal of Veterinary Research 16: 116-119. (January) 1955.]