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centrifugally. It gave the usual color reactions for protein, e.g., biuret and TBP (Tetrabromophenolphthalein) reactions, and contained no detectable carbohydrate or phosphorus. The ultraviolet absorption spectrum of the purified hemolysin was characteristic for protein, with a maximum at 276  $m\mu$ . The absorbancy at 280  $m\mu$  was found to be 1.1 for a 1 mg/ml solution.

These data suggest that the hemolysin is a protein-like substance.

The activity of the purified hemolysin was rapidly decreased by standing at room temperature or temperatures of 0° and -20°C.

The hemolytic reaction of the purified hemolysin had an optimum pH of 7.0 and was temperature-dependent below 40°C. It was found that the normal sera of cattle, pigs, sheep, and mice exerted an inhibitory effect on the hemolytic reaction.

The purified hemolysin was toxic to mice injected intravenously but not when injected intraperitoneally. The toxicity was closely correlated with hemolytic activity. The minimum lethal dose in mice was approximately 1,000 H.D.<sub>50</sub>.

## RELATIONSHIP OF FRUCTOSE CONCENTRATION AND BOVINE SEMEN CHARACTERISTICS OVER AN EXTENDED PERIOD

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(Summary of Master's thesis written under direction of Dr. T. ISHIKAWA)

1. Materials used were 103 semen samples obtained from 6 fertile Holstein bulls in an artificial insemination center. The semen was collected about every four days by the artificial vagina method. The semen samples used in this experiment were chosen at about 15-day intervals from May 1962 to July 1963.

2. A statistical analysis was made of eight semen characteristics using SPEAMAN's coefficient rank correlation and analysis of variance. None of these characteristics, i.e., volume and pH of semen, concentration of spermatozoa per milliliter semen, massive activity, individual motility, percentage of abnormal spermatozoa per 1,000, protoplasmic droplets per 200 spermatozoa, and fructose concentration per deciliter semen, showed any significant difference ( $p < 0.05$ ).

3. There was no significant correlation between the fructose concentration and the concentration of spermatozoa or the volume of semen ( $p < 0.05$ ).

4. The fructose content was estimated by the author's modification of MANN'S

method. The fructose concentration could be estimated from relative potency obtained by four points assay, instead of using the standard line in usual method.

## HISTOPATHOLOGICAL CHANGES IN THE URINARY BLADDER IN BOVINE HEMATURIA

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Histopathology of the bladders in twelve cases of bovine hematuria was studied. In some of the cases, in addition to the bladder, various other parts of the whole body were also examined.

The following changes were particularly noted in the bladders: Degeneration and loss of nerve fibers in the intramural nerve bundles (the condition of polyneuritis), perivascular, halo-like loosening, formation of a globular substance which was regarded as the event having a relation to the loosening, neoplastic growths of the blood vessels, and various other neoplastic growths.

In three cases, the peripheral nerves in various parts of the whole body other than the bladder, such as the various nerves of the body and the nerve bundles being distributed to the various organs and tissues, had also organic changes identical with those observed in the bladder.

In two cases, neoplastic growths were observed both in the bladder and in other parts of the body.

Some considerations were offered on the possible histo-pathogenesis of the hemorrhages (hematuria) within the scope of permission.

The present study indicates that future study of bovine hematuria should be carried out from a general point of view.