

Animal Keepers' Forum



Dedicated to Professional Animal Care

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conference.....79

Portland, Oregon

INCIDENCE OF LEPTOSPIROSIS

IN CAPTIVE RHINOS

by

Phil Prewett
Houston Winbigler

On June 10, 1979, the Memphis Zoo experienced the death of a ten-year-old female Black Rhinoceros; ten days later the death of an eight-year-old male occurred. All evidence indicates these to be the first documented cases of Leptospirosis in captive Black Rhinos. In the wild there has been only one reported case.¹ That animal was found down and unable to stand. It was euthanized and the necropsy revealed the presence of Leptospirosis by culture.

Hopefully this presentation will encourage keepers to work as closely as possible with their veterinary staff in the attentive observations of their charges.

Leptospirosis, commonly referred to as Weil's disease or the red water disease, is primarily transmitted through the urine of an infected animal (especially rodents) and usually enters through a mucus membrane or a cut. Although there are five strains, pathologists detected two *Leptospirosis canicola* and *Leptospirosis icterohemorrhagiae*, through postmortem blood testing on the Memphis animals. The bacteria which cause this disease are not hardy and die quickly when exposed to only moderate heat, light or even slightly acidic soil conditions.

Leptospirosis is not uncommon in domestic animals. It affects the kidneys and liver, causes loss of coordination, abortions and massive breakdown of blood. It is because of clotted blood and serum voided that it is referred to, especially by ranchers, as the red water disease. The disease and ensuing death is not uncommon in cattle but has little affect on horses. In goats it frequently brings on abortion storms. It should be noted that, prior to the Rhino deaths at the Memphis Zoo, the round barn, a rodent-infested hoofed-stock compound which also serves as a central feed storage area of the mammal section, had already sustained the losses of a Rocky Mountain Goat and a Siberian Ibex. These deaths were both attributed to Leptospirosis.

Both the aforementioned Black Rhinoceros, Snoopy and her mate Punion, who was imported in 1973, were quartered in the Pachyderm building, which also houses their eight-month-old male calf, another adult female Black Rhino, a breeding pair of White Rhinos, and single African and Asiatic Elephants. Three stalls, one holding area, and two outside lots which were surfaced with crushed limestone were provided for the Rhinos, and Snoopy and her calf were allowed access to the outside lots alternating with the other animals. The inside facilities were cleaned and washed daily and periodically steam-cleaned and scrubbed with Rocal-D disinfectant. Sanitation for the outside lots consisted of removing unused hay and fecal matter and the routine cleaning of a large pool.

continued

Incidence of Leptospirosis in Captive Rhinos, continued

The Black Rhinoceros' lot also contained a man-made mud wallow, which was equipped with no provisions for drainage and had degenerated into a cesspool of dung and muck capable of harboring any number of pathogenic micro-organisms. Subsequent to the death of a second animal, however, this wallow was dug out, limed, filled with a layer of limestone and topped with sixteen inches of sand. This sand pit has now been utilized by all residents of the building.

The first Black Rhinoceros to die, Snoopy, was born in the Denver Zoo in 1968. She arrived at the Memphis Zoo in 1969 and was joined shortly by another female born in the St. Louis Zoo. In 1973 the herd was completed with the addition of a wild-caught male from Rhodesia whose estimated age was four years.

No significant medical problems were detected until May of 1977 when Snoopy exhibited some degree of ataxia, constipation, and large clots of blood found in pools of urine. She received at this time, Gentocin, vitamin K, Azium, and vitamin B complex injections; but she was still displaying symptoms after a week and it was decided that a more thorough examination should be made. On May 24, 1977, she was immobilized with M-99, given a thorough examination, administered the same drugs and supplements, and received a large enema. Results from the tests indicated slightly elevated liver function, and she was also slightly anemic.

Upon the assumption of her recovery, she was again placed with the male and was bred repeatedly. Toward the latter stages of gestation she was separated from the other Rhinos, and on November 7, 1978, she delivered a healthy male calf.

On June 8, 1979, the female again showed signs of constipation and she went off her feed. By the next afternoon she was voiding reddish urine and showing signs of ataxia. She had already started to wean her calf, so it was decided that the two should be separated. Snoopy, who was usually fiercely protective of her calf, stayed in a prone position while four people entered the stall to rope and remove her calf. When the calf was restrained, Snoopy staggered to her feet, made a wobbling effort to charge, and fell back down. After this, she was darted with 15 c.c. each Genotocin, Azium, vitamin K, and Vitamin B complex.

At 11 p.m. she was observed to be on her feet walking. She was, however, found at 6:30 a.m., June 10, lying dead in her enclosure.

A necropsy was carried out that morning, and although her overall appearance was healthy, her body cavity was filled with red fluid; her bladder was filled with dark red urine; the liver, though not enlarged, was of an orangish color and extremely friable; and her kidneys, showing extensive perirenal edema, displayed, upon cross section, pinpoint hemorrhages. Upon the completion of the necropsy, the cause of death was determined to be from hemolytic anemia, and specimens were sent to several pathology labs to determine the cause of this condition.

Prior to being shifted to another lot on the afternoon of June 20, 1979, the adult male Black Rhinoceros appeared to be very lethargic and displayed poor locomotion and marked uncoordination. During routine

Incidence of Leptospirosis in Captive Rhinos, continued

cleaning and inspection of the lot, the keeper noticed a large pool of reddish-brown urine. Immediately he was placed under observation, separated from the female with whom he was sharing the lot, and the veterinarian was summoned. While attempting to shift this animal into an indoor stall, he collapsed and died.

Preparations for conducting a post-mortem examination were made at once. A necropsy was performed that evening, and with the exception of excessive bone deterioration (asymptomatic to Leptospirosis) the necropsy revealed the same information as the one conducted after the first death, ten days prior. The animal had died of a hemolytic anemia.

While awaiting the results of tests, the Pachyderm complex was placed under a strict quarantine. The doors were closed to the public, daily disinfecting of the entire building was initiated, and the building was placed off-limits to all zoo personnel except the mammal curator, his assistant, and the zoo veterinary staff. All Rhinos were kept inside and their lots were covered with a layer of lime as a precautionary measure.

During this interim period, tests were conducted for blood parasites, E.I.A., Clostridia, anaplasmosis, copper poisoning, fungi, tuberculosis, and a heavy metal screen was conducted; all tests came back negative. Blood was also taken from the remaining two Black Rhinos and the two elephants. An attempt to take blood from the White Rhinos was made but only the male was cooperative. In addition to the sanitary measures mentioned in the preceding paragraph, as a protective measure, all Rhinos were put on Lixotinic, an iron supplement, and began receiving tetracycline with their feed. It should be mentioned here that the red blood count on the remaining female Black Rhino had at this time begun to drop. It decreased from what seems to be a normal thirty-five, to twenty-seven, to twenty-five, to a low of twenty-two.

Nine days after the death of the second Rhino, results from some of the blood tests were received from Kord Animal Disease Laboratory in Nashville, Tennessee. These indicated that the male Black Rhinoceros died of a hemolytic anemia as a result of Leptospirosis. The titer for *Leptospirosis Canicola* was moderately high, and was extremely high for *Leptospirosis Icterohemorrhagiae*. This diagnosis, which is based on the Microscopic Agglutination test, uses live leptospires and is considered by experts to be the most acceptable and accurate leptospirosis serology yet developed. This diagnosis of Leptospirosis is based entirely on serology.

We, however, using a culture, were unable to find active leptospires in any tissue. Immediate diagnosis was not possible in the first subject due to the delay between death and necropsy. The rapid destruction of blood components made detection virtually impossible. Even in the second death, the massive and rapid breakdown of the blood made it of limited value. In fact, blood from this male was injected into a goat and a sheep but failed to produce a higher blood titer.

Following the results of the tests, all animals in the building were vaccinated against all five strains of Leptospirosis. Each animal received a double dose of killed Leptospirosis vaccine except the Rhino calf who received what is considered to be a normal dose. It is, at this point, noteworthy that the Asiatic elephant displayed a moderate titer for *Leptospirosis Icterohemorrhagiae*, but after her vaccination she displayed an extremely high (one to eight thousand) blood titer.

Incidence of Leptospirosis in Captive Rhinos, continued

After this outbreak of Leptospirosis, to eliminate any rodent problems, all of the grain entering the Pachyderm building is immediately placed in rodent proof containers. Although the animals at the Pachyderm building have been vaccinated, not enough is known to maintain a regular schedule of inoculation for Rhino.

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** 4th Reptile Symposium on Captive Propagation & Husbandry is to be held June 13-15, 1980 at the Ramada Inn, Monroe, LA 71201. Pre-registration information available from Lynn McDuffy, Host Committee, LA Purchase Gardens & Zoo, Box 123, Monroe, LA 71201. 318 322-8966.**

SNOW BABIES FIND NEW HOME

by
Dianne Devison
Keeper II, Nursery, Health Unit, Metro Toronto Zoo

On January 10, 1980, two female Polar Bear Cubs arrived at Metro Toronto Zoo. The cubs were orphaned by an Inuit hunter who shot their mother. We can only assume that our mild Canadian winter brought the female and her cubs out of the den so early in the winter. When the cubs were discovered by the hunter, they were loaded onto his snowmobile and taken to an R.C.M.P. Officer in Sanikiluaq, a hamlet on the Belcher Islands, North West Territories. The Officer was having trouble getting the cubs to nurse and contacted the zoo. We agreed to take them. They were flown to the zoo the next day. The cubs, age about two and one-half months old, were in good health. They were placed in a hospital quarantine for a thirty day period.

With a little encouragement, both nursed well. Several baby nipples were tried and it was found that they accepted a lambs' nipple best. They were fed four times per day; running shifts from 7 a.m. to 10 p.m., on a formula of 1:1 Carnation Milk and distilled water, rice pablum and vitamin drops. After about one week of this diet, we ran into a loose fecal problem and digestive upset. The milk was changed to Esbilac but the smaller bear continued to have problems. The shifts were extended to midnight to keep a closer eye on her. After two weeks of medication and close observation, she was well enough to join her sister in the viewing nursery.

The two cubs quickly outgrew the nursery that had been prepared for them. Six weeks after arrival the two cuddly blue-eyed balls of fluff of 16 and 18 pounds had turned into two balls of fury of 29 and 35 pounds. They are thriving on a meat, dog chow, and milk mixture from a dish and now reside in the Polar Bear maternity exhibit.