SURVIVAL ANALYSIS OF BLACK RHINOCEROSES (*Diceros bicornis*) IN CAPTIVITY IN THE UNITED STATES

Patricia M. Dennis, DVM, PhD, Dipl ACZM,[1]* Paivi J. Rajala-Schultz, DVM, PhD,[1] Julie A. Funk, DVM, PhD,[1] Evan S. Blumer, VMD,[2] R. Eric Miller, DVM, Dipl ACZM,[3] Thomas E. Wittum, PhD,[1] and William J.A. Saville, DVM, PhD, Dipl ACVIM[1]

[1]Department of Veterinary Preventive Medicine, the Ohio State University, 1920 Coffey Road, Columbus, OH 43210 USA; [2]The Wilds, 14000 International Road, Cumberland, OH 43732 USA; [3]Saint Louis Zoo, One Government Drive, St. Louis, MO 63110 USA

Abstract

A survey was conducted to identify disease-related risk factors associated with decreased survival in the captive black rhinoceros population in the United States. This study surveyed 40 of the 43 (93%) facilities and included 296 of the 334 black rhinoceroses (88.9%) ever in captivity between the years 1930 and 2001. The data consisted of information collected on 270 black rhinoceroses housed in captivity in AZA accredited zoos between the years 1930 and 2001. Information on the animals was collected until the animal's death or completion of the survey. Survival analysis, using the Cox proportional hazards model, was performed to study the effects of disease parameters on survival. The dependent variable was the age of the animal at time of death or censoring. A black rhino was considered censored if it was alive at the time of the survey, with censoring occurring on the date of the survey visit. This study identified several risk factors associated with decreased survival time, including the presence of skin lesions, hypercalcemia, dental calculus, neurologic signs, jaundice, muscle necrosis or rhabdomyolysis, and signs consistent with idiopathic hemorrhagic vasculopathy. The finding of this study with the most serious implications for management of captive black rhinoceroses is that being housed at more than one institution is associated with an almost two-fold increase in the likelihood of death in a given time period as compared to animals housed only at one institution.