Serous fat atrophy and other nutrition-related health problems in captive giraffe (Giraffa camelopardalis). An evaluation of 83 necropsy reports

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SEROUS FAT ATROPHY AND OTHER NUTRITION-RELATED HEALTH PROBLEMS IN CAPTIVE GIRAFFE (Giraffa camelopardalis) – AN EVALUATION OF 83 NECROPSY REPORTS

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Abstract

Historically, the nutrition of captive giraffes (Giraffa camelopardalis) has been regarded as difficult, and several different disease complexes suspected to be at least partially of dietary aetiology have been observed in this species (Clauss et al., 2002a). From the literature, it seems that the condition of serous fat atrophy (SAF) at necropsy is the most predominant of these problems (Fowler, 1978; Junge and Bradley, 1993; Potter and Clauss, 2005), and a variety of causes has been proposed for this finding (9). However, other problems, such as acidosis, phytobezoars (Clauss et al., 2002a), excessive tooth wear (Enqvist et al., 2003), mandibular fractures (Kaandorp, 2001), or vitamin E deficiency (Letzner, 2001) have been described. From the existing literature, it is difficult to judge whether these are really frequent problems, or whether their occurrence is overestimated. Therefore, we contacted European zoos participating in the giraffe EEP with the question to send us copies of their available necropsy reports.

We received a total of 83 necropsy reports or notes for animals from 0.5 years of age onwards, from 14 facilities, between 1962 and 2003. The findings documented in these reports were transferred into an EXCEL datafile, which was subsequently used to quantify different categories of findings or diagnoses.

In general, the quality of the reports was highly variable, ranging from a short note of the major finding to very detailed reports covering every organ system. The age was given or could be calculated in 59 cases (otherwise, animals were stated to be “adult”, or time at the respective facility = minimum age was given). The oldest animal was a female that had been kept for more than 30 years at its zoo, the oldest known age was 27 years in a female. Three animals were below one year of age but already weaned. Of the 56 animals of which the exact age was known to be one year or older, 77 % had died before reaching 15 years of age.

Among the nutrition-related diseases, rumen acidosis (pH of 5.5) was reported in 2 of 4 cases in which the pH of the rumen contents was measured (i.e., in 79 cases, it was not mentioned whether this parameter had been measured or not). The only reported histological investigation of rumen mucosa indicated a ruminitis including hyperkeratosis and a lymphocyte infiltration of the submucosa. Phytobezoars were observed in four animals: three in the rumen and one in the omasum. In 47 reports, no statement was found regarding the contents of the rumen; 75/54/46 reports did not comment on the ingesta in the omasum/abomasum/intestinal tract. The teeth of 70 animals were not mentioned; of the remaining 13, 8 had signs of excessive tooth wear or dental disease.
One case of a mandibular fracture was documented. Two cases of foreign body ingestion were noted. No case of white muscle disease (indicative of vitamin E deficiency) was recorded; in this respect, it was remarkable that none of the reports mentioned the state of the tongue muscle – the predilection site for white muscle lesions in giraffe.

No comment on the absence or presence of adipose tissue was made in 51 cases. 4 reports mentioned the presence of body fat. In 28 cases, however, the absence of fat and/or the presence of “serous” or “gelatinous”, atrophied fat tissue in the coronary groove, the mesentery, or “generalized”, was explicitly noted. Of the reports without any comment on the presence or absence of body fat, 26 did not contain any statement regarding the nutritional state of the animal, 13 documented a “normal” or “good” body condition, and 12 a “poor”, “emaciated” or “cachectic” condition. Therefore, a total of 40 out of the total 83 animals (48%) were in poor or emaciated condition. One could even argue that 40 cases of poor body condition were noted out of 57 cases that commented upon body condition at all (70%); however, it appears more likely that body condition was not extraordinary (good or poor) if it was not mentioned at all. A closer examination of these 40 cases showed that in 27 cases, no definite diagnosis of the underlying problem had been reached (with only one of these animals being older than 30 years); 3 cases of tuberculosis, 3 cases of pneumonia, 4 cases of massive parasite (helminth) burden, and one case each of foreign body trauma, perforative abomasal ulcer, massive hoof problems including a fracture of the last digit. Five of the animals of poor body condition/SAF had reportedly been euthanized for loss of condition. In six animals with poor body condition and no definite diagnosis, excessive tooth wear or dental health problems were reported. Of the 26 animals of poor body condition of which the exact age was known to be one year or older, 73 % had not reached 15 years of age.

Other frequent findings in this survey included: 15 cases of reported arthrosis/arthritis (absence of pathologic lesions in joints noted in 2 cases, joints not mentioned in 66 cases); 7 cases of reported hoof problems (absence of abnormal appearance of hooves noted in one case, hooves not mentioned in 75 cases); 7 cases of tuberculosis; 6 cases of traumatic fractures of the skull or neck; 2 cases of listeriosis.

Most giraffes of this survey did not even come close to the reported longevity records in captivity of 24-36 years (Jones, 1980). The results suggest that inadequate energy provision, and even a negative energy balance, occur regularly in captive giraffe, and that an adequate nutrition should be one of the major concerns of giraffe husbandry. As in similar data collations (Clauss et al., 2002b; Schwitzer et al., 2004), the incompleteness of necropsy reports, either due to lack of investigation or non-reporting of “normal” findings is a major problem in data interpretation, except for syndromes that are of an overruling frequency as SAF in giraffes. For example, from the data collected here, no reasonable conclusion can be made as to the frequency of rumenitis or tooth wear. In order to improve this situation, the use of an EEP-wide standard necropsy protocol is recommended.

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References


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