

SELECTION OF PROPER FEEDS TO ASSIST IN THE DENTAL MANAGEMENT OF CARNIVORES

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Proper dental care of carnivores in a zoological setting is of utmost concern among zoo professionals. Dental health is based on nutrition, environment, and overall animal health. This paper deals with the nutritional aspect of carnivore health. Zoo carnivores are able to survive on a variety of diets in captivity, but in order to assure proper dental health, feeds which imitate the natural diet are more likely to maintain dental health than feed which is foreign to the animal.

Large felids such as lions, tigers and leopards are often fed diets which are primarily based on a processed meat and may have bones added to the diet to support some natural cleaning of the teeth. This diet does not closely imitate a natural diet which would include hair, rumen contents, fresh, moist cartilage and bone, and copious amounts of natural vegetation. All of these items help to keep teeth clean and less susceptible to disease.

Ursids also have many potential problems with dental health. This can also be related to the quantity and type of dry diet they are fed. The dry "kibble" or "chow" diet is often a mainstay in bear diets. The optimum diet should contain sufficient nutritional components and have significant texture to simultaneously clean the teeth and exercise the supportive periodontium. The gingiva, periodontal ligament and alveolar bone benefit from the stimulation of chewing. Processed food which is soft or "cakes" on to the teeth and gums contributes to periodontal breakdown and caries. This is due to the accumulation of plaque, essentially a bacterial colony, and calculus or "tartar," the calcified form of plaque.

Natural diets of carnivores, other than a few scavenger species such as hyena, do not include dry bones or even large bone. Dry bones or synthetic bones are so hard and carnivores mouths are so strong, that their use frequently leads to fracture of teeth when the animals are allowed to gnaw on them. The author (Scheels) has observed and dealt with this in numerous domestic and exotic carnivores for over 20 years. The authors are also opposed to providing frozen food or ice as enrichment due to the damage the hard ice may do, particularly in conjunction with the temperature contrast presented to the crystalline enamel. (Chewing ice in drinks by Scheels' human patients is a very common cause of tooth fracture)

The authors recognize that it may not be easy to provide diets that offer optimum nutrition and stimulation to captive species. But many institutions do so, and have realized the benefits of comfort and health in the captive carnivores. The captive carnivore's mouth is not easily observed or treated, however, it is much more easily observed than it is treated! Optimum diet considerations should be part of the preventive medicine program and is much easier to implement than to treat serious pathologies. The preventative medicine program combined with

the implementation of a husbandry training program will great aid in the early detection of these emerging or hidden problems.

All animals will naturally try to hide discomfort and weaknesses from disease. Caregivers are the frontline of health care and should be knowledgeable of early signs of oral/dental disease even if they are subtle to the casual observer. These signs can include changes in food intake or food preference, dropping of or playing with food, general changes in demeanor and activity, alterations in the animal's general appearance (haircoat or body condition), and changes in stool quality.

These observations and this knowledge has been available for generations and practiced successfully by many people, but it is far from universal. Sir Frank Colyer published these general observations in his classic 1936 text *Variations and Diseases of the Teeth of Animals*. These tenets have been published with the exotic veterinary literature many times, such as the papers by Phillip Robinson and David Fagan in the 1980's and many others since. This fundamental part of exotic animal care should be universal today. This information should be made readily available to all caregivers and veterinarians

In summary, the dental health of the zoo carnivore is largely dependent on its diet. Proper selection of the diet, combined with a husbandry training program and a schedule of dental examinations and treatment can lead to a long-lived animal with excellent dentition.