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ENERGY AND MINERAL NUTRITION IN CAPTIVE HIPPOPOTAMIDAE

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Poster abstract
The captive management of the common (Hippopotamus amphibius) and the pygmy hippopotamus (Hexaprotodon liberiensis) is characterised by few veterinary or dietary problems. With increasing attention to possible overfeeding and obesity of animals kept in zoos, the adequacy of the usual dietary regime with a high proportion of energy-dense feeds such as bread or concentrates (2) should be re-evaluated. Hippos are a particularly challenging taxon for this purpose, since (a) conventional assessments that use body mass are difficult to apply to male common hippos because males grow indefinitely (3), and (b) owing to their amphibious lifestyle, digestion trials are difficult to perform.

This study was designed to assess the digestibility of diets that include or exclude concentrates and supplements. The experiments were carried out with four common and four pygmy hippos at Whipsnade and Berlin Zoological Garden. All animals were considered to be in good body condition and did not have a history of any dietary problems. Animals received either a regular diet of roughage and concentrates (RC diet) followed by a roughage-only diet (R diet), or a diet of fresh grass in restricted amounts (restr. diet) followed by a diet of fresh grass in unrestricted amounts (ad lib. diet). In a pilot study, the feasibility of such trials using acid detergent lignin as an internal marker had been established (4). Pygmy hippos were weighed on a scale; body weights (BW) of common hippos had to be estimated. All feed items offered to and rejected by study animals were weighed and faeces regularly collected. Feeds and faeces were analysed for calcium (Ca), phosphorus (P), sodium (Na) and gross energy content (GE).

Dry matter intake was low compared to other herbivores and ranged from 0.3-0.9 % BW in common and 0.5-1.4 % BW in pygmy hippos. Mass-specific digestible energy (DE) intake ranged from 0.14-0.54 MJ/kg⁰.⁷⁵ in common and 0.13-0.44 MJ/kg⁰.⁷⁵ in pygmy hippos. Highest values were obtained for RC diets. DE intake for the ad lib. diet was about 0.3 MJ/kg⁰.⁷⁶ in common and 0.2 MJ/kg⁰.⁷⁵ in pygmy hippos. Ca, P and Na contents of the rations consumed were adequate by ruminant standards except for the R diet where Na supply was marginal.

The results indicate that known mass-specific DE intake values from domestic animals (e.g. horse DE maintenance requirement of 0.6 MJ/kg⁰.⁷⁵) are not suitable to predict the lower energetic needs of hippos, supporting the idea that hippos may have lower metabolic rates than the mammalian average (1). The good health and body condition of animals receiving the fresh grass diets indicate that a higher energy provision by the addition of concentrate feeds may be unnecessary; ideally, this should be corroborated by regular weighing of the animals. Data on the Na content of the diets used suggest that mineral supplementation may be necessary; this could be achieved by providing a mineral supplement rather than a complete pelleted feed.
References