The effect of fine granular sand on pododermatitis in captive greater flamingos (Phoenicopterus roseus)

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Abstract

Pododermatitis is a worldwide health and animal welfare problem in captive flamingos (Phoenicopteridae). Since sub-optimal substrate or flooring has been described as a factor in the development of pododermatitis in poultry and raptors, it is also suspected to play a role in flamingo foot health. Small groups of flamingos were separated from the main group in an indoor enclosure with artificial grass carpet and, in earlier years, concrete flooring, with additional fine granular sand in the water basin for the study year. Feet were evaluated before and after the separation. Judged subjectively, foot lesions had shown a general increase in the indoor enclosure in earlier years. In contrast, lesion severity and prevalence, scored in accordance with a standardised protocol, decreased when fine granular sand was provided. Since flamingos were observed mostly standing on sand and as this represented the major differentiating factor between years, it is concluded that fine granular sand is a favourable substrate to maintain, and one that may even lead to an improvement in flamingo foot health.

Keywords: animal welfare, flooring, foot problem, greater flamingo, pododermatitis, substrate

Introduction

Approximately 5,200 greater flamingos (Phoenicopterus roseus) are kept in over 130 institutions worldwide, for the most part in Europe (ISIS 2011). A survey of 20 European and North American zoos showed that up to 100% of captive flamingos suffer a variety and degree of foot problems (Nielsen et al 2010). Among other birds, raptors, owls (Strigiformes), cockatiels (Nymphicus hollandicus) and penguins (Sphenisciformes) are most affected by pododermatitis (Halliwell 1975; Reidarson et al 1999; Harcourt-Brown 2008). In raptors, the type 1 to 4 classification for bumblefoot lesions describe nodular lesions of differing severity (Halliwell 1975). Since flamingos are afflicted by lesions other than the nodular variety, a different classification had to be devised to score the severity of hyperkeratosis (slight overgrowth/marked overgrowth), fissures (superficial/deep), nodular lesions (without ulceration/with ulceration) and papillomatous growths (finger-like/cauliflower-like) (Nielsen et al 2010). Foot lesions tend to occur in captivity, and foot problems in wild birds have been rarely reported (Herman et al 1962). Substrate has been described as an important factor in the development of pododermatitis in poultry (Martrenchar et al 2002; Meluzzi et al 2008; Youssef et al 2010), and bumblefoot in birds of prey is associated with inadequate perching surfaces (Halliwell 1975). None of investigated substrates — bare concrete, vinyl or rubber lining, soil or grass — could be identified as particularly suitable for flamingo foot health, all having their respective disadvantages (Nielsen et al 2012). In flamingos, a positive correlation was found between climate as well as time spent indoors and the prevalence of fissures in a survey performed in 20 European and North American zoos (Nielsen et al 2012). This finding suggests that factors such as flooring, humidity of flooring, space levels or feeding regime — all of which differ between indoor and outdoor enclosures — are possibly associated with the prevalence of pododermatitis.