

# THE EFFECT OF INCREASING DIETARY FIBRE ON FEEDING, RUMINATION AND ORAL STEREOTYPIES IN CAPTIVE GIRAFFES (*GIRAFFA CAMELOPARDALIS*)

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**Abstract**

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Many captive giraffes perform oral stereotypies, in particular tongue-playing, licking of objects (including conspecifics) and vacuum chewing. Typically, the diet of these large ruminants in captivity consists mostly of food concentrates, which are consumed rapidly and do not provide stimulation for their long, prehensile tongues. In the wild, browsing requires extensive use of this organ but in captivity material upon which to browse is limited. Consequently, vacuum activities, such as mock leaf-feeding behaviour, and stereotypies may develop. Rumination is also a major component of a giraffe's behavioural repertoire. It is essential for proper digestion, but may also be connected with non-REM sleep. Inadequate opportunities for rumination may also contribute to the development of oral stereotypies. In this study of captive giraffes, we examined the effect of increasing dietary fibre on the time spent ruminating and feeding and the extent to which oral stereotypies were performed. Two giraffes of different age, sex and sub-species were studied at Paignton Zoo Environmental Park. Dietary fibre was increased by the addition of coarse meadow hay to their existing diet. Following the addition of hay, time spent feeding did not change significantly but there was a significant increase in the time spent ruminating and a significant reduction in time spent performing oral stereotypies by both giraffes, suggesting that oral stereotypies may be connected with rumination rather than feeding. Stereotypic behaviour is generally accepted to be an indicator of sub-optimal welfare. Thus, the reduction in this behaviour by the simple addition of coarse fibre to the diet can be interpreted as enhancing the welfare of these animals.

**Keywords:** animal welfare, behaviour, diet, sleep, stereotypy, tongue-playing

## Introduction

Stereotypies are generally considered to be indicators of sub-optimal welfare of captive animals. One possible cause of these behaviours is the lack of opportunity for the animal to perform innate behaviour patterns to a satisfactory extent (Mason 1991). Many stereotypic behaviours seem to relate to foraging and appetitive behaviour (Mason & Mendl 1997). Stereotypies in captive herbivores (fed on diets largely consisting of concentrated feeds, presented in limited time and space) often seem to result from the lack of opportunity to fulfil their innate motivation to perform foraging, consumption and digestive behaviour patterns (Appleby & Lawrence 1987; Terlouw *et al* 1991). For instance, in pregnant gilts the incidence of abnormal oral behaviours can be reduced by increasing dietary bulk, achieved by using higher-fibre-content feeds (Robert *et al* 1993). This effect seems to be attributable

