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Enrichment of gorillas with ensiled willow: tastes for more

It is recognized that good husbandry practice in captive gorillas includes the daily provision of leaves and twigs of bushes and trees (browse) throughout the year. Plants consumed by gorillas in the wild are particularly fibrous which implies an adaptation of their digestive system to high fibre diets. Previous studies proved that increasing the amount of dietary fibre has a positive effect on health, satiety and natural behaviour. Wintertime is however a major challenge in European zoos housing gorillas. This study examined the palatability of willow twigs (*Salix burjatica* x *Salix. Viminalis*) ensiled with two types of commonly used additives (1. molasse (4% of willow (DM)) + homofermentative silage inoculant (10^8 CFU/kg fresh browse); 2. nitrogen (flushing drum with 2 bar, 1.5 min). Three types of enrichment barrels (empty, 250 gram willow additive 1, 250 gram willow additive 2) were each 8 times ad randomly offered during the morning or afternoon to four gorillas housed at Zoo Antwerp. The behaviour of the gorillas was individually observed for 2.5 hours after offering the browse by means of "all occurrence sampling". Ensiled willow silage was accepted by all gorillas and they were motivated to work for this food. The time spent eating willow was equal among used additives. Also, results show that foraging time for vegetables decreased when ensiled willow was offered, which might suggest a preference for ensiled willow over their standard meal. However, the provision of this limited amount of ensiled browse was insufficient to reduce abnormal behaviour (regurgitation/reingestion, coprophagy) and stress related behaviour such as yawning and scratching. Moreover, despite the provision of one barrel per individual, it was clear that gorillas lower in rang spent less time eating the ensiled browse. More challenging ways of browse enrichment or increasing the amount of barrels or browse might be more successful in decreasing abnormal behaviour or stress. The provision of ensiled willow did significantly increase positive social behaviour among the gorillas. Yet, on days that the animals received primate pellets on top of their regular diet, this positive effect disappeared. This emphasizes the negative impact of competition for food on social behaviour. This research also revealed that, in contrast to the wild, the gorillas were more active in the afternoon compared to the mornings. The animals showed more foraging behaviour but also significantly more abnormal and stress related behaviour. A possible explanation is the provision of a broader range of vegetables in the afternoon which might have led to more competition within the group. Increasing efforts to provide browse during winter as well as investing in feeding strategies that reduce competition for food is therefore important to enhance welfare in captive gorillas.

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