

This study dealt with energy intake and obesity in captive lemurs. Its intent was to examine possible relations of feeding, especially overfeeding, on the one hand and population dynamics with regard to litter size and infant mortality on the other hand.

Captive body weights of lemurs of different species were analysed with regard to deviations from wild weights and to the proportion of obese individuals in the European captive populations. Food and energy intake in captive groups of two lemur taxa, *Varecia variegata variegata* and *Eulemur macaco flavifrons*, was examined in three different zoos with reference to obesity possibly caused by super-optimal feeding and/or sub-optimal energy intake patterns. The long-term development of the European captive populations of two ruffed lemur subspecies was described, and data were examined for changes in population dynamics, especially litter size, over time. These changes were investigated with reference to a possible relation to super-optimal feeding (as expressed in female body weight).

The mean body weights of lemurs of 7 species weighed in European zoos exceeded the mean wild weights of the respective species. The proportion of obese individuals in the different captive samples ranged from 0% to 80%.

Lemurs in all three zoos that were included in this study showed a high energy intake. Given that for all studied lemurs actual digestible energy intake was 65% of the calculated energy intake values, as a feeding trial revealed for two ruffed lemurs at Cologne Zoo, the *E.m. flavifrons* group at Mulhouse Zoo and *V.v. variegata* in the second observation period at Cologne Zoo consumed an adequate amount of energy, whereas all other groups exceeded their requirements. A preference for fruit over vegetables was obvious.

The pattern of energy (and dry matter) intake over 24 hours differed between the three zoos for both studied taxa. In ruffed lemurs this coincided with differences in the proportion of stereotypies exhibited by the animals. Stereotypies were mainly shown prior to feeding times. After the change of feeding schedules at Cologne Zoo both taxa showed slightly less stereotypies than before.

The European populations of both ruffed lemur subspecies studied showed rather high growth rates, but females differed largely in reproductive output. For both subspecies combined, female body weight correlated significantly positively with litter size, but did not show a correlation with infant mortality. There was a trend that female body weight increased over the generations.

Lemurs may be adapted to an unpredictable environment with long periods of food scarcity and thus prefer energy-rich food, the intake of which may rather be regulated by availability than through intrinsic mechanisms. The results of this study are compatible with this assumption. When kept in zoos with a stable supply of energy-dense food, body weights increase and the animals may finally become obese.

On the population level the study could provide first hints on a relationship between female body weight and reproductive output in ruffed lemurs. The results indicate that feeding is an important factor in the management of small populations with the potential to promote changes in population dynamics and, in the medium run, to enhance the loss of genetic variability. If a considerable proportion of a population is overweight, the suitability of this population as a reserve that may need to be reintroduced into the wild some day is questionable. Captive lemur diets therefore need to be closely monitored with regard to their nutrient and specifically their energy content.