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IMPROVING THE DIETARY REGIME FOR CAPTIVE LEMURS AT IVOLOINA PARK BY COMPUTER-BASED RATION ANALYSIS

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Poster abstract
Ivoloina Zoological Park (PZI) is a regional conservation center with breeding programs for several lemur species. A survey of body weights of individual lemurs kept at PZI indicated a moderate nutritional status of many animals. Therefore, the objective of this study was to improve the nutritional management of lemurs based on an intake study and a computer-based ration calculation. 34 animals of five lemur species – Varecia variegata, Hapalemur griseus, Eulemur fulvus, E. coronatus and E. macaco were involved in the study. In a first step, the diets fed and actually ingested by the lemurs were quantified by weighing the offered food items and the leftovers for 7 consecutive days. The diets consisted of fruits (banana, apple, pear, peach, mango, papaya), vegetables (cucumber, carrots, cabbage, string beans), browse (bamboo Cathariostachys madagascariensis, hazomboay Pittosporum senecio), and other items (potatoes, manioc, and eggs). The fresh weight ratio of ingested fruits:vegetables:browse:others was 16:4:79:0 in H. griseus and 75-77:8-11:6-15:2-7 in the other species, with V. variegata consuming the least amount of browse. Standard nutrient composition values or, in the case of the browse species used, data from own lab analyses, were used for the calculation of the total diet nutrient composition. Nutrients considered were protein, fibre (as neutral detergent fibre), calcium (Ca), phosphorus (P), sodium (Na), potassium (K), magnesium (Mg), and gross energy. Total dry matter intake varied from 43-83 g/kg0.75 between the lemur species, and in three of the five species, there was a mean weight loss during the trial week. When compared to recommendations (NRC 2003), the diet of H. griseus was considered deficient in protein and P, and that of the other lemurs additionally deficient in energy, Ca, and fibre.

In the absence of a nutritionally complete, pelleted primate feed, the composition of the food items in use, and additionally pineapple, bread, honey, peanuts, and a human infant milk cereal (Nestlé Cérélac) were used, together with the target values, to optimize the diets for the different species by linear programming in EXCEL SOLVER. The resulting solutions were diets with ratios of fruits:vegetables:browse:others of 17:35:41:7 in H. griseus and 41-42:24-33:6-20:11-23 in the other species, contained more string beans, and were improved in the target parameters. The practicability and acceptance of these diets was assessed during a second intake trial. Dry matter intake varied from 54-76 g/kg0.75. All diet items were accepted but for the eggs which were refused by H. griseus. During the week of this second intake study, there was an average weight gain in all species.

The computed reduction of fruits (and increase in green vegetables) is in accord with similar recommendations made for primate feeding in the literature. If a complete, pelleted/biscuit diet is not available, a combination of high-energy feeds (as bread or peanuts) with green vegetables will result in higher protein and Ca levels than a fruit-based diet. The long-term effects of such dietary regimes remain to be assessed.