

ENERGY EXPENDITURE OF CAPTIVE ADULT NON-REPRODUCTIVE COMMON MARMOSETS (*CALLITHRIX JACCHUS*) IS BELOW ANTHROPOID PRIMATE NORM

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Abstract

The National Research Council (NRC) recommendation for the maintenance energy requirement (kcal/day) of captive non-human primates is twice the estimated metabolic rate or $140 \times (\text{body weight})^{0.75}$. This recommendation may be an overestimate of the energy requirement for common marmosets due to the fact that marmosets reduce metabolic rate significantly (up to 30-35%) during sleep. Obesity has become a major concern in captive marmoset colonies. We present data on day- and night-time resting metabolic rate (RMR) and daily digestible energy intake (DEI) for 22 adult common marmosets of both sexes and body weights ranging from 322g to 618g. RMR was measured using open circuit respirometry with animals in a temperature-controlled chamber set at 30°C, which is within the marmoset thermal neutral zone. DEI was the average of two four-day digestion trails in which food intake and fecal output was measured and gross energy quantified with bomb calorimetry. DEI equals energy intake minus fecal energy loss. Mean body weight was 435 ± 16 g; mean day-time RMR = 31.3 ± 1.3 kcal/day and night-time RMR = 26.3 ± 2.1 kcal/day; and mean DEI = 52.5 ± 2.4 kcal/day. The mean value for day and night RMR was 83.5% and 70.1% of the NRC estimated RMR value for 435g primates (37.5 kcal/day), respectively. Mean DEI was 1.7 times day RMR, twice night RMR, and only 70% of the NRC recommended value for 435g primates (75 kcal/day). We suggest that the equation $100 \times (\text{body weight})^{0.75}$ provides a better target for daily maintenance energy intake for adult non-reproductive captive marmosets.