Effects of Feeding Time on Adipocyte Characteristics and Fat Metabolism in Rats

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Abstract

Effects of different feeding time (day vs night feeding) on the weight gain, adipocyte cellularity, plasma fatty acid profile and plasma leptin levels in rats were examined. Thirty male 8-week old Sprague Dawley rats were randomly allocated into day feeding group (DFG) as control, and night feeding group (NFG). They were fed 10% of their body weight with standard rat chow once a day. The DFG was fed at 0800h and NFG at 1900h. Both groups were exposed to 12:12 h light-dark cycle. Daily feed intake and weekly body weight were monitored. Five rats from each group were sacrificed at weeks 1, 3, 5 to collect blood for plasma fatty acids profiling and plasma leptin levels analysis. Abdominal fat were collected for adipocyte cellularity analysis where the number and diameter of fat cells were measured. Weight gain, increment of adipocyte numbers and plasma leptin levels was significantly ($P<0.05$) higher in NFG than DFG rats. There was no significant ($p>0.05$) difference in feed intake, adipocyte diameter and plasma fatty acids profile in both groups. Clearly, night feeding has an effect on fat metabolism and deposition where more adipose mass are accumulated which leads to more weight gain in rats. In summary, although nutrient absorption and mobilization was not affected by feeding time of the day, night feeding promoted the accumulation of more fat mass.

Keywords: rats, feeding time, body weight gain, adipocyte cellularity, leptin.