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## Energy expenditure in rats varying in percent body fat

### Energieumsatz und Körperfett

#### Aim

The purpose of this research was to examine the relationship between variable body fat content and resting metabolic rate as well as energy cost of physical activity in rats.

#### Materials and methods

The study was carried out in 36 six-month-old female Wistar rats and 36 two- and half- year old female Wistar rats. Animals were fed ad libitum two isoenergetic diets differing in protein to carbohydrate ratio (3.95% fat, 16.7% protein, 65% carbohydrate (standard stock diet) versus 3.95% fat, 19.06% protein, 56.37% carbohydrate (diet B). The applied dietary regimens as well as duration of the study resulted in differentiation of body composition of experimental rats. Body fat content ranged from 5-10% for growing rats and 7-25% in aging rats. After the study, the rats were sacrificed and their chemical body composition analyzed.

O<sub>2</sub> consumption and CO<sub>2</sub> production of all experimental animals were analyzed with a thermomagnetic O<sub>2</sub>

analyzer (OXYGOR 6N) and an infrared CO<sub>2</sub> analyzer (UNOR 6N) produced by Maihak, Germany. Measurements of resting energy expenditure and energy cost of physical activity were conducted in an acclimatized opened-circuit animal respiration chamber.

#### Conclusions

Results obtained in this study showed that

1. Resting metabolic rate of female Wistar rats ranging from 6 months to 2.5 y of age and weighing from 145 to 417 g was a direct linear function of their body weight with a correlation coefficient of  $r=0.94$  at  $p=0.001$ .
2. Energy cost of physical activity performed on a horizontal treadmill was a direct linear function of the body weight of female Wistar rats (145-417 g).
3. Body fatness did not influence the magnitude of both resting metabolic rate and energy cost of physical activity in rats with body fat content ranging from 5-10%, but positively affected the dimensions of resting energy expenditure and energy cost of physical activity in rats with percent body fat from 7-25%.
4. Body weight was a better reference standard compared with lean body mass protein body mass or dry body mass.