

Laboratory mice (strain MF1) were used to investigate the effects of dietary fat intake on lactation performance. The specific dynamic action (SDA) for high fat (HF), medium fat (MF) and a low fat (LF) diets was measured using open-flow respirometry at 4.5%, 3.9% and 6.1%, respectively. The same three diets were fed ad libitum to mice between days 4 and 18 of lactation. Mice fed HF, MF and LF diets reached plateau in their daily food intake at 14.95 ± 1.14 g day⁻¹, 16.30 ± 0.61 g day⁻¹ and 16.57 ± 0.26 g day⁻¹, respectively between days 12-17 of lactation. At weaning, litters from HF and MF-fed mice were significantly heavier than pups on LF diet. This was because the HF and MF-fed mice not only consumed more energy at peak lactation but also delivered more milk energy to their pups than the LF-fed mice. Evidence suggested that the positive effects of feeding fat to mice were in part due to the low SDA and probably low heat production for milk synthesis. Probably, the ability of the HF and MF-fed mice to directly transfer absorbed fat into the milk might have reduced the heat production of lactogenesis. The HF and MF diets had beneficial effects on lactation because they increased the capacity of mice to generate milk more efficiently and wean heavier offspring than mice fed LF diet. The daily energy expenditure (DEE) of mice in the three dietary groups was fixed. **KEY WORDS:** Laboratory mouse, dietary fat, specific dynamic action, doubly labelled water, daily energy expenditure, milk energy output, reproductive performance