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Feeding strategies of the tammar wallaby (*Macropus eugenii* Desmarest).

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Abstract

The tammar wallaby (*Macropus eugenii* Desmarest) is a small, grazing, fermentative herbivore with a high digesta throughput. The strategies it uses to overcome energostatic constraints are investigated in captive and in free living specimens in a bush pasture ecotone in the Rotorua district of North Island, New Zealand. The feeding events of captive tammars have a relatively invariant crepuscular rhythm with no evidence of meal formation. The duration of feed events, but not their frequency, increases with poorer quality food. These features of ingestion may promote efficient fermentation in the stomach. The grazing events of free ranging tammars are longer than their browsing events. The efficiency of grazing by tammars may be increased by a concerted biting and chewing action of incisors and molars resulting from a lateral rotation of both lower hemi-jaws which causes the occlusive surfaces of lower dental arrays to be drawn across those of the upper dental arrays. The chewing rates of tammar wallabies are similar to those of other small herbivores. A comparison of the sizes of foregut digesta particles in tammar wallabies and in larger macropods indicates that the former may expend relatively greater masticatory effort. In tammar wallabies browsing is relatively inefficient and frequent leaf dropping during handling results in the dry matter intake of browse falling below estimated daily requirements. Analyses of the gross anatomy of tammar intestines show that the hind gut may be the site of significant 'secondary' fermentation. The colon is longer and the small intestine shorter than in browsing species of an equivalent size. There is a reciprocal variation in the weight of stomach and hindgut contents such that the mass of fermentative digesta in the hindgut is augmented during times when that of the stomach is reduced. Females have a greater amount of stomach and colon tissue with a longer caecum and colon per unit body size than males. The drinking behaviour of tammar wallabies fed dry foods may be specialised to maintain fermentative efficiency. Captive tammars fed with small, succulent, low quality food items are able to achieve dry matter compensation and never drink. When dry foods are fed, drinking is associated with feeding events and increases in frequency with lower quality food. Tammars exhibit two distinct resting behaviours which are uninfluenced by diet but resting is inhibited for a period following drinking or eating.

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