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Foraging Behavior of Cattle in a Diverse, Mountainous Grazing Land: Bite Size Estimation of Plants by Hand-plucking Method

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Hand-plucking method was conducted in a diverse, mountainous grazing area, to clarify whether bite size of cattle is affected by plant species and foraging height. The data was collected at a pasture-forest combining grazing area in the Field Science Center, Tohoku University, north-east district in Japan, in early summer and early autumn. Biting frequency and foraging manner of individual plant species were estimated by visual observation of focal animals. Foraging heights were also recorded simultaneously. Based on these data, 11 major plant species (six herbaceous plants, four trees and one vine) were chosen and plant samples were collected by hand-plucking method mimicking foraging manner of the animals by four persons. For trees and vine, samplings were done from three different layers (upper: 120-180 cm, middle: 60-120 cm, lower: 0-60 cm) which were set based on the position of animal's head. There was a significant difference in bite size among plant species; *i.e.*, bite size of *Acer rufinerve* and *Carex albata* were significantly higher than other plants ($P<0.05$). Bite size was also higher in summer (0.31 g DM/bite) than in autumn (0.19 g DM/bite) ($P<0.001$), but there was a significant interaction between plant species and season ($P<0.01$). For trees and vine, bite size in upper layer showed a tendency to be higher than in middle and lower layer ($P=0.071$). In *Viburnum dilatatum*, a significant higher bite size was observed in upper layer than in middle and lower layers. These results show that greater bite size can be obtained by foraging of tree species, when defoliation from upper layers is beneficial for the animals to increase bite efficiency throughout the seasons.