USING PLANT WAX ALKANES TO ESTIMATE DIET SELECTION IN SHEEP

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The alkane concentrations of the cuticular wax of 'pasture plants vary between plant species. This permits the estimation of the species composition of herbage mixtures from their alkane content and that of the component species (Dove 1992). We examined whether the same approach could be used to estimate the species composition of the herbage consumed by the grazing animal.

Six oesophageally-fistulated (OF) sheep grazed 0.4 ha of clover-dominant pasture (herbage mass 4-5 t/ha) from 3 October 1990. They had not grazed such a pasture before. Samples of OF extrusa consumed at a single grazing were collected on 9 and 22 October. Samples of pasture were cut on 18 October and separated into component species. The species composition of the diet consumed between 14-20 October was estimated from rectal faeces samples taken twice-daily over that period. All samples were freeze-dried prior to alkane extraction and analysis by gas chromatography. The species compositions of OF samples and the consumed diet were estimated from their alkane compositions and those of the pasture species, using least squares optimisation.

The botanical composition of the sward is shown in the table, together with the estimated composition of the OF samples and the diet consumed by the same animals over a six-day period. The regressions relating the alkane pattern of the estimated selected material (OF sample, faeces) to its observed alkane pattern did not differ significantly from the line of equivalence.

TABLE 1 Species composition of herbage, OF samples and diet

Sample	Subterranean clover	Sorrel	Yorkshire Fog	Perennial ryegrass	Other grass*	Dead
Herbage (18/10)	0.589	0.190	0.008	0.024	0.032	0.157
OF sample						
(9/10)	0.548	0.232	0.016	0.006	0.262	0.024
(22/10)	0.845	0.087	0.035	0	0.035	0
Consumed diet						
(14-20/10)	0.880	0.030	0	0	0.018	0.073

* Chiefly annual ryegrass and Vulpia sp.

Early in the grazing period, the botanical composition of OF samples was similar to that of the pasture measured 9 days later. However, by the second sampling there was clearly selection for the subterranean clover. Moreover, the species composition of the herbage collected at the second OF sampling was very similar to that consumed over the six-day period. These results indicate that differences in alkane composition between plant species can be exploited to estimate the composition of the consumed diet. They also suggest -that, once accustomed to a new pasture, OF sheep select in a single grazing a diet similar to that which they would consume over a more extended period.

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