

# Practical application of a one-parameter approach to assess the accuracy of two different estimates of diet composition in sheep

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**Introduction** The composition of ingested herbage mixtures can be estimated using the alkane technique (Dove & Moore, 1995). Until now, the accuracy of the estimates is assessed by linear regression of estimated and actual proportions of the dietary components. The authors presented an approach to compare actual and estimated diet compositions using only one parameter named *Distance* (*D*; Elwert & Rodehutschord, 2005), thus enabling a statement regarding the similarity of estimated and known diet composition. In a feeding trial with sheep, diet composition was estimated using two different levels of information. The accuracy of the two estimates was assessed and compared using *Distance*.

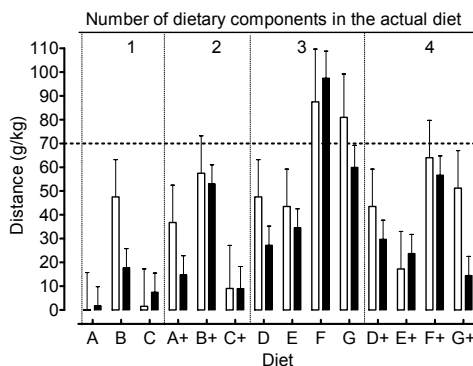
**Materials and methods** In a balance trial with adult wethers (liveweight ~ 70 kg) selective intake of three roughages (perennial ryegrass [P], meadow fescue [M], red clover [R]) and barley was simulated. Diets A to G contained (P:M:R g air-dry matter): A 750:0:0; B 0:750:0; C 0:0:750; D 250:250:250; E 375:75:300; F 525:187.5:37.5; G 75:525:150. Diets A+ to G+ contained further 100 g air-dry matter of beeswax-labelled barley. Diets were fed once daily to a total of 4 animals per diet. Alkane concentrations in feed and faeces were determined according to Elwert (2004). Faecal alkane recovery rates (FARR) were calculated for each animal separately. Diet composition was estimated using EatWhat (Dove & Moore, 1995), and it was assumed, that all animals had potential access to all dietary components. Methods of estimation differed by the level of information included: Method 1 was based upon experimental means of FARR and alkane patterns of the components; method 2 was based upon dietary means. *Distance* was calculated as the square root of the sum of the squared differences of estimated from known proportions of each dietary component in the diet according to Elwert & Rodehutschord (2005).

**Results** *Distance* between estimated and actual diet compositions averaged 42 and 32 g/kg for methods 1 and 2, respectively. This difference was significant. The inclusion of barley in the diets had no effect on *Distance*. The accuracy of method 1 - which represents current situation in grazing experiments - was satisfactory. The inclusion of more specific information increased the accuracy of the estimate of diet composition: Out of 52 observations, 10 and 3 observations (methods 1 and 2, respectively) showed a *Distance* of more than 70 g/kg, which was chosen as the threshold to declare estimated and known diet compositions as dissimilar. It could be noticed, that those diets that had a high *Distance* contained large amounts of M. This could be attributed to a high degree of heterogeneity within that component throughout the experiment.

**Conclusions** Using the parameter *Distance*, the accuracy of an estimate of diet composition can be assessed. It does not allow for the assessment of the accuracy of individual dietary components.

## References

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**Figure 1** Accuracy of estimated diet composition in 14 diets based upon experimental (blank bars) or dietary (black bars) means of FARR and dietary component alkane concentrations (means and s.e.)