

Introduction

The nylon bag technique is a very simple and useful biological tool [1] with its use dating back to the early 19th century [2] when the nylon bag was used in vivo nutrition experiments. The nylon bag technique has been widely adopted to evaluate the rate and extent of degradation through the microbial rumen degradation processes [3]. The principle behind the technique is that feed samples of identified weight are put in the nylon bags with pores allowing entry and exit of the rumen fluid to allow degradation of feed [2] in the pre-weighed bags.

The samples are prepared in duplicates and incubated in the rumen of a stulae animal for a range of times. Degradation of material in the nylon bag is made possible by the ability of the bag to allow entry and exit of rumen fluid. This ability of the nylon bag to allow entry and exit of rumen fluid can also be taken advantage of to reduce cost and time of feed analysis through batch analysis of samples bagged in nylon bags.

and ether extract batch analysis. Consistent with this hypothesis, the objective of this study was to determine the optimum number of bags that can be used in batch analysis of CF and EE determinations.

Methodology

A completely randomized block design was used for the study, three blocks and five treatments. The three blocks were the samples of feed each with the following treatments: treatment 1 (control), treatment 2 (1 bag), and treatment 3 (2 bags), treatment 4 (3 bags) and treatment 5 (4 bags). Samples of Katambora, veld hay and maize stover were ground using a laboratory hammer mill with a 1 mm sieve. For the control samples 1g of each sample was weighed replicated three times and ether extract and crude fiber were analyzed according to the Analytical of Association Chemist [6]. For the bagged sample, 1g of feed was weighed and put directly in the nylon bag and for each sample, 16 bags were made. The bags for each sample type were randomly allocated to the four treatments with treatment 2 and 3 replicated 3 times while treatment 4 and 5 did not require replication since this had been done through batching of the samples. The nylon bags were tightly closed and EE and CF analysis were done using the procedure as described by Analytical of Association Chemist (AOAC) (1990) at the University of Zimbabwe, Animal Science Department [6]. The results were analyzed using SAS (1998) [7]. Cost of analysis for each sample and component was done using the laboratory charges as per cost of analysis in the Department of Animal Science.

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These results indicate that for katambora grass, up to four bags can be used in a batch and this is also supported by the savings resulting from use of more bags (Table 3). This can serve a lot of non-renewable energy which is very good for the environment. However for the other two, the optimum number of bags is 2 because use of up to 4 bags for maize stover and veld hay although cheaper, (Table 3) would significantly ($P < 0.05$) underestimate ether extract.

Conclusion

There is a potential to do batch analysis with optimum number varying between forage type and component of analysis. For crude fibre analysis, the optimum number of bags for all forage types per batch is two. For ether extract determination, the optimum number of bags for Katambora grass is 4 while that for veld hay and maize stover is two. It is recommended that trials using more than one feed sample be done to determine the effects of the methods on analysis of different samples in the same task.

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