

EVALUATION OF SOME METHODS AVAILABLE TO DETERMINE
THE DIGESTIBILITY OF LOW QUALITY ROUGHAGES

BY

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ABSTRACT

This thesis comprises of six chapters. The details of some techniques available for digestibility determination of ruminant feeds are reviewed in Chapter 1. The techniques discussed include AIA-marker method, in vitro rumen fluid technique, in vitro pepsin-cellulase technique and nylon bag technique. With each method the principles involved and the associated sources of variations and their accuracy in in vivo digestibility predictions are detailed.

The Chapter 2 presents the investigation carried out in order to study the diurnal variation of AIA marker excretion. The morning and afternoon grab faeces samples were collected during a collection period of 10 days, and compared for any difference in AIA%. The results of this study indicated that there was no significant difference in AIA% between morning and afternoon samples.

The chapter 3 consists of the work undertaken to find out the effect of length of collection period on the accuracy of digestibility values obtained by AIA marker method. The results of this study indicated that the collection period should be comparatively longer for straw diets than for grass diets.

The chapter 4 reports the results of the investigation undertaken to study the validity of 4 techniques; AIA-marker method, in vitro rumen fluid and pepsin cellulase technique and Nylon bag technique, in predicting in vivo OMD of roughages. The in vivo OMD values (by total collection) of 39 feed samples were compared with respective OMD values predicted by each technique. The results indicated that AIA, rumen fluid and nylon bag techniques were superior to pepsin-cellulase technique at overall comparison. However, as the overall correlations were not adequately high, separate comparisons were carried out after partitioning of samples according to different digestibility ranges and to different types of feeds. An improvement of correlations was observed when partitioning done according to the type of feed but, not under different digestibility ranges. This indicates that the validity of techniques is not similar for all the feeds. In addition, it was observed that inclusion of crude protein content as an additional variable to the model of rumen fluid and nylon bag predicted in vivo values improved the predictability with straw samples.

Chapter 5 is concerned on application of nylon bag to study the degradation of feed samples. Nine feed samples consisting of 2 untreated straw, 2 urea sprayed straw, 2 treated straw, 2 grass and one rice bran sample, were used and measurements were taken at 12, 24, 48 & 72 hrs incubation. The results indicated that these incubation periods are not adequate for complete degradation of roughage samples, and this technique could be used to identify the aspects on which the feeds differ in their degradability.