INTRODUCTION

The ever increasing importance of animal nutrition research is reflected in the increasing annual turnout of literature on the subject. Knowledge has accumulated apace on the full compass of livestock feeding problems. The nutritive value of a vast number of both common and lesser used animal feeding stuffs has been determined. This has brought into existence a comprehensive range of feeding data from which the farmer may calculate the rations for his livestock.

The completeness of this data does not, however, extend to tropical crops and livestock and the amount of scientific work which has been done in this direction is very limited. For many of the processed products of tropical crops digestibility figures have been determined in American and European research centres and the nutritive value worked out. The crops themselves, however, as grown in their own tropical environment have received little attention, and no comprehensive list of feeding standards has been made available. Consequently, animal feeding in the tropics is still largely an art with too little scientific knowledge to back it. Feeding is based on standards laid down for American and European conditions. In many cases the coarse fodders fed to livestock are almost entirely uninvestigated and the concentrate rations alone are fed with any knowledge of the actual feeding values they are likely to supply.

The great need for extended work in this sphere scarcely needs emphasis. Wood (59) observes that cattle nutrition in the tropics is almost an unknown field and points out the very obvious likelihood of a difference in the powers of digestion of Bos indicus compared with Bos taurus. Paterson (39) has directed attention to the need for research in the tropical fodder grasses. Harrison (23), surveying the problem in Trinidad, has laid emphasis on the importance of digestibility trials as a means to improved nutrition and an approach to the wider problem of livestock improvement.

The study of nutrition is considered to be of primary importance in livestock improvement and to constitute a first means of approach to the problem. Faulkner (13) has emphasised that an improvement of the cattle of Nigeria must be preceded by an improvement of their diet. Wright (64)

followed the same theme in surveying Indian conditions noting the lack of information available as to the composition and digestibility of Indian foodstuffs.

From India, also, much work has shown up the differences of tropical conditions and more particularly of Bos indicus compared with Bos taurus. Indian cattle appear to have different requirements from European cattle (49, 50) and a greater capacity for digesting coarse fodder. European cattle are bred for capacity whereas the Indian cattle are said to possess greater extractive capabilities (33, 34).

Coupled with this greater extractive ability of Zebu Indian cattle is the shortage of protein rich fodders in tropical countries (64). Carneiro and Rhoad (7) have noted that the tropics are characterised by lack of forage rich in protein. Saint (47) writes that proteins are usually lacking in the foods produced on the plantation and calls for the growth of more leguminous fodder crops. Hammond (22) ascribes degeneration of Bos taurus in the tropics to inferior rations lacking in protein and containing a high percentage of fibrous and indigestible material. In Trinidad this problem is acute, the roughage protein ration alone being supplied fully from local sources. Coconut meal is the only concentrate produced locally in bulk sufficient for feeding purposes. The question is whether sufficient use is being made of local possibilities and whether more protein can be grown.

This has an important bearing on self-sufficiency. The tendency in the West Indies is to import rather than use home grown foodstuffs. As Harrison (23) has stated $170,000 worth of cattle feed is imported annually into this island. He calls for development of our local foodstuff resources and for their most advantageous and economical utilisation.

A start has already been made (6, 25, 27, 35, 40, 41) in the study of these problems in Trinidad and some progress is recorded. Analytical data is available on the commoner perennial fodder grasses and figures of digestibility based on the work of Maule, Hobbs and Capstick are available from one trial on each of these fodders. Apart, however, from this and one trial each on Savannah Grass and on Sweet Potato Vines the field is unexploited and complete ignorance prevails. The first essential is

repetition of the work already done to obtain reliable average figures of digestibility. Further, the study of the nutritive value of these perennial fodder grasses at different stages of growth has not been attempted, and record of the age of the fodder fed appears to be purely incidental. This has a direct bearing on the shortage of protein rich forage in the tropics i.e. optimum cutting stage for maximum protein content. The investigation of locally grown legumes likely to be useful as cattle fodders is another essential calling for immediate attention. This work, treated systematically, would lay the foundation for scientifically controlled cattle feeding in Trinidad.

Hitherto the investigation of the digestibility of fodders pursued at the College appears to be haphazard and to bite here and there at the problem with no decisive aim and no clear results. Broadly, the investigations appear to lack the co-ordination of a long term policy which would, as far as possible, lay down the aim and scope of the attack and be in line with work in the other colonies. Considerable sums have been spent on the investigations undertaken at the College the results of which may fail to have any significance unless part of a co-ordinated plan which will ensure the repetition and extension of such experiments with the object of formulating reliable basic rationing standards.

The work of this thesis is largely an extension of the previous investigations by Capstick and others (6, 25, 35). The study of the protein question is commenced and, in particular, the investigation of leguminous crops likely to prove suitable as cattle fodders, and of their use in mixtures with fodder grasses. At the same time a start has been made in the study of the optimum age of cutting of the commonly grown perennial fodder grasses with special reference to protein content.

At the same time also, the method of approach by means of digestibility trials has itself received attention and a few of the many aspects of this subject are discussed.