

INTRODUCTION

The preliminary work on this project, which is reported on the following pages, was begun by Dowson in 1955. His objects were three fold:-

(1) To test the Thermister in the field and gain information on how best to use it.

(2) To obtain information on certain physiological reactions of the experimental cattle such as rectal temperature, skin temperature, pulse rate, respiration rate and also on their general behaviour.

(3) To study the effect of showering animals under differing conditions.

The Thermister referred to was again used, but, owing to an accident, was not found to be entirely satisfactory.

The animals used were in the College dairy herd of Zebu x Holstein crosses. Except for the periods when they were being recorded they were run normally with the rest of the herd. No attempt was made to select animals of the same size and colour. The animals were selected purely on the basis of similarity of age, and, as far as possible, stage of lactation. This allowed a maximum of two groups of three for Part I of the project and two groups of four for Part II. Within and between these groups there were considerable differences in size and colour. Recordings were started in October 1956 and taken at intervals until February 1957.

There were two basic reasons for doing this work. Firstly, it was hoped that some information might be obtained which would give some pointers as to improvements in herd management. Secondly, it was desired to investigate differences between animals as to their heat tolerance and

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physiological adaptability to conditions in Trinidad. Lack of uniformity of animals within a breed or herd for certain physiological characteristics has been mentioned by Lee (1950). Animals best adapted to conditions in Trinidad could be bred from in order to improve the quality of the stock.

From the outset the work reported here had certain important limitations. The herd numbers about 40 animals of which only 15-20 are in milk and from these it was only possible to select a small number of suitable animals. In addition, facilities for the work were strictly limited. As a result, only simple recordings were made of the animals' physiological reactions and weather conditions. Though Rhoad (1944) suggests that his Heat Tolerance Coefficient is probably the best guide to the heat tolerance of individuals it must be noted that the coefficient is based on body temperature. Since it was not possible to find the H.T.C. of the animals it seems reasonable to take body temperature as the primary criterion of heat tolerance. Kriss (1921) found that the body temperature of cattle was never constant, but the differences were very slight. In addition, most workers seem to have stressed body temperature rather than other physiological records. In order to make best use of the facilities the project was run in two distinct parts. Part I was an investigation of the effects of age and stage of lactation on heat tolerance. Part II was an investigation of the differences in heat tolerance of animals kept inside and outside during the day. Originally, in a third part it had been intended to use a pedometer to measure distances traveled by animals under differing conditions. However, this type of instrument is much more useful under conditions of extensive grazing where animals travel many miles in search of food. Since grazing on the College farm is intensive it was decided not to use the pedometer.