

INTRODUCTION

Very little data is available on the water requirements of crossbred cattle in the tropics under range and pasture conditions, the work that has been done on this subject relates mainly to pure temperate breeds (Bos taurus) or Zebu types (Bos indicus). The lack of knowledge on the requirements of the crosses of these two genera is surprising since this cross-breeding is being used all over the tropics as one of the major methods of increasing cattle production.

It was with this paucity of information in mind that the following observations were undertaken.

The part played by clean water in the physiology of domestic animals has been stressed by many workers. Detailed information on the distribution of available water in the animal body is discussed by Flemister (1942), and Bonsma (1939) summarises the need for water in the animal body as follows :-

1. Softens the feed and dissolves the nutrients.
2. Transports the soluble food.
3. Removes waste products.
4. Regulates body temperature.

The latter fact is of paramount importance to cattle in the tropics, particularly exotic breeds and their crosses, the subject being dealt with at length by Findlay & Beakley (1954). The infrequency of rivers and streams, and the absence of piped water supplies in many tropical countries makes water a much more limiting factor than in temperate regions, especially during the marked dry season experienced in many of these areas. Grazing grounds and water supplies are often miles apart consequently stock may only have access to water at two or even three day intervals. French (1956), working in East Africa with Zebu and Zebu-Ayrshire cattle, studied the effects of restricted watering and found that dry matter intake was reduced with the consequent retardation of the animals growth and development.

It is perhaps interesting to note that Onaba (1958) working with Zebu-Holstein crosses in Trinidad found that milk quantity and quality was unaffected when drinking was limited to twice per day during the dry season period.

A further problem caused by the seasonal water shortage is the progressive degeneration of the herbage by over-grazing around the permanent water holes which eventually results in the loss of large numbers of stock from starvation and co-incident infections.

The shifting cultivation system still widely practiced in tropical areas will no longer support the increasing population nor will it fulfill the demands for a higher standard of living. For some time now it has been recognised that a fixed system of Agriculture based on the principles of mixed farming would alleviate some of the problems in certain intensive areas.

One of the essentials of mixed farming is the planted ley or pasture to support grazing stock and these leys have been successfully introduced into the dryer tropics. It is only recently however with the wider use of such grasses as Pangola (Digitaria decumbens) that the pendulum in the wet tropics is swinging away from traditional soilage grasses to semi-permanent pastures.

To recover the expense of laying down such pastures the grazing stock must have the inherent ability to produce, economically, meat, milk or butterfat. In most areas the indigenous Zebu cattle do not possess this ability and, although temperate breeds are genetically capable of high productivity, they often fail to express these capabilities under the climatic conditions found in the wet tropics. The answer seems to lie in the production of Bos taurus - Bos indicus crossbreds whose types and blood proportions are determined by the local environmental conditions.

Trinidad has a climate which is typical of the wet tropics, and the crossbred most frequently encountered here is the Zebu-Holstein, the average blood proportions being $3/8 : 5/8$ in favour of the Holstein. This type of animal is being widely used in Trinidad as a grazing animal both on peasant farms and more specialised dairy farms. As with many other improvement schemes this type of stock was recommended and distributed long before the basic knowledge of their nutritional requirements or adaptability had been established.

In an effort to produce some fundamental data on this type of stock the authors selected for study the vital aspect of total water intake defined as the water drunk plus the water taken in with the feed; the phrase 'water consumption' refers only to the free water drunk. Most of the previous work on the subject has been with temperate breeds of cattle usually kept indoors or pens and not allowed to graze.

Stanley (1938) using large numbers of Hereford cattle calculated the daily water consumption under range conditions in Arizona. Although his work emphasized that water consumption was related to ambient temperature and dry matter intake, further relevant climatic data, herbage moisture contents and the like are not given. Some useful water consumption tables for all classes of livestock are given by Sykes (1955), but again the cattle referred to are all temperate breeds. Moberly (1956) working under Trinidad conditions observed the water drunk by four Zebu bulls to be 1.3 gals. per 920 lbs., however, low stock numbers reduces the value of these figures. Similar results are given by Rollinson (1955) working with Zebu cattle in Uganda who found a mean of 1.9 gals. per animal per day was consumed and that this consumption increased with body weight. Again no milking stock were included or feed-water assessed. Further work in Uganda by Jacobson and Irigiei (1954) at Serere using Zebu cattle indicated that 1 gal. per 100 lbs. live weight in the dry season and 0.5 gals. per 100 lbs. in the wet season were drunk by this type of stock.