

A COMPARATIVE STUDY OF THE WORK PERFORMANCE OF
INDIGENOUS AND CROSSBRED BUFFALOES

By

WARAWATTE WASANTHA KUMARA

~

Thesis

Submitted in partial fulfilment of the requirements

for the degree of

MASTER OF PHILOSOPHY

in the

POSTGRADUATE INSTITUTE OF AGRICULTURE

of the

UNIVERSITY OF PERADENIYA

SRI LANKA

C 636.292

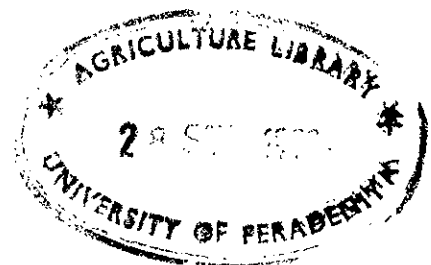
W17



503823

AGRICULTURE LIBRARY
UNIVERSITY OF PERADENIYA

AUGUST, 1998



503823

ABSTRACT

The use of animal power for agricultural activities has been a common practice especially in the third world countries. However, little attention has been paid to optimize the output from draught animals used in farming operations. It is important to the farmer to have a knowledge of animals' energy when he designs or selects tools for his farming activities.

There are two breeds of buffaloes viz. indigenous breed and the cross breed, found in Sri Lanka. This research was aimed at investigating and comparing the work performance of these two breeds of buffaloes.

Even though many studies on the work performance of animals have been done in the past, most of the measurement systems used require improvement. Continuous monitoring of physiological parameters of the animals is expected to provide a clear picture of the physiological condition of the animal at any instance during work. Therefore, modern electronic transducers were developed and automatic data recording systems were employed during the field testing phase of the study.

For the purpose of quantifying draught capacity, six indigenous and six crossbred buffaloes were used separately to drag a specially designed cart which acted as the load as well as the frame that held all the measuring instruments. An automatic data recording system and several sensors were used to measure and record some of the environmental

and physiological parameters such as the body temperature, speed of travel, force exerted by the animal, environmental temperature and, relative humidity. Parameters such as the respiration rate and pulse rate were measured using other sensing techniques that were not connected to the data logger.

The analyses revealed that there was no significant difference in the work performance between indigenous and crossbred buffaloes. During the process of carting, the respiration rate of buffaloes increased from 72 to 110 per minute and the speed of travel varied from 0.5 to 5 km/h and the generated force varied from 100 to 500 N. Their draught performance decreased with increasing temperature and increased at high relative humidity levels.

The developed instrumentation system worked successfully providing real time data. The major achievement was the capability to make measurements and record data on buffaloes during their work. The sensors and the recording system could be used for other research activities which require measurement of environmental and physiological parameters related to working animals. The author also wishes to highlight the necessity to develop reliable sensing techniques for the measurement of pulse rate and respiration rate of buffaloes.