

GRAZING AND WORK STRESS ON THE LIVE WEIGHT CHANGE OF MASHONA OXEN

V.L. Prasad¹, P. Mandebvu² and C. Mhonde³

¹Chief Reserach Officer, Makoholi Experiment Station, P Bag 9182, Masvingo, Zimbabwe.

ABSTRACT: The main objective of the study is to quantify grazing and work stress of Mashona oxen in two different live weight groups. Twenty four Mashona oxen in the age group of five years were divided into two groups and subjected to two different planes of nutrition to accentuate the live weight difference between them. The resultant High Live weight (HL) and Low Live weight (LL) groups were further subdivided into 3 groups each to give six treatment groups: 1. work and restricted grazing 2. no work and restricted grazing 3. no work and full grazing. Group 1 animals pulled sledges carrying 160 kg for 3 hrs for a period of 21 days. Group 2 remained in pens till they were sent to graze with

group 1 animals at 9:00h. Group 3 animals grazed from 06:00h for seven hours. Animals with lower live weight lost significantly ($P < 0.05$) less live weight compared to the high live weight group. The loss of weight per kg and kg^{0.75} of initial live weight was 74 g. and 322 g respectively for LL group while it was 102 g and 457 g for HL group. It was found that loss of weight due to work production per se was 17 kg in LL group and 27 kg in HL group. It was concluded that lighter animals were more efficient in work production in terms weight loss for a given output of work, compared to heavier animals.

Key Words: Draught, Liveweight, Stress, Ploughing.

Introduction

Smallholder farmers of Zimbabwe keep cattle mainly for draught power use (Shumba, 1985; GFA, 1987). However, frequent droughts and the resultant high cattle mortality substantially decreased the availability of draught power during the past two decades (LeRoux, Stubbs & Donnely, 1978; Rusike, 1988; Tembo 1989). The veld (natural pasture) which is the mainstay for animal production in Zimbabwe cannot support body weight gains in the dry season due to the declining nutritive value of the grass (Elliot, 1984). As a result the oxen are weak at the onset of the rains and often turn out work at the expense of body weight. The main objective of the study is to quantify grazing and work stress of Mashona oxen in two different live weight groups.

Material and Methods

Twenty four Mashona oxen in the age group of five years, treated for internal and external parasites

were divided into two groups and subjected to two different planes of nutrition to accentuate the live weight difference between them. The resultant High Live weight (HL) and Low Live weight (LL) groups were divided into 3 groups each to give six treatment groups: 1. Work and restricted grazing 2. No work and restricted grazing 3. No work and full grazing.

Group 1 animals were made to pull sledges carrying 160 kg for 3 hrs daily for a period of 21 days. The stress was considered equivalent to that the oxen in the smallholder sector would be subjected to, when they ploughed 2-3 hectares of land. Group 2 remained in pens till they were sent to graze with group 1 at 9:00h. Group 3 animals were sent for grazing from 06:00h for seven hours.

The animals were weighed before after the experimental period. The loss of weight in group 1 at the end of experimental period was taken to represent grazing stress. Stress due to restricted grazing and work per se were derived from the mean differences in liveweight change across three groups at the end of experimental period. Data were analysed using Mstat package.

²Research Scholar, Department of Animal Science, University of Arkansas, Fayetteville, AR, USA.

³Research Technician, Makoholi Experiment Station, P Bag 9182, Masvingo, Zimbabwe.

Table 1. Liveweight changes of draught animals in low liveweight(LL) and high liveweight(HL) groups 1. work and restricted grazing 2. no work and restricted grazing 3. no work and full grazing.

Variable	HH			LH		
	1	2	3	1	2	3
Initial Live Weight Kg	353.50	351.00	352.75	409.50	411.00	409.50
Final Live Weight Kg	327.25	341.75	345.50	367.87	396.50	401.37
Loss in Live weight Kg	26.25 ^b	09.25 ^a	07.25 ^a	41.63 ^c	14.50 ^a	08.13 ^a
Loss in Live weight G/kg	74.25 ^b	20.72 ^d	20.55 ^d	101.60 ^a	35.27 ^c	19.85 ^d
Loss in Live weight G/Kg. ⁷⁵	321.70 ^b	114.00 ^d	113.00 ^d	457.32 ^a	158.84 ^c	89.31 ^e

Table 2. Loss of liveweight (KG) due to dry season stress, curtailment in grazing and work stress in low liveweight(LL) and high liveweight (HL) groups

Loss of live weight(kg) due to:	LL	HL
Dry season stress	07.25	08.13
Curtailed grazing	02.00	6.37
Work stress	17.00	27.13
Total weight loss	26.25	41.63

Results

The liveweight changes of different groups are presented in Table 1. There was a significant ($P < 0.05$) difference in the liveweight change across treatment groups. The HL work group lost 41.6kg as against 26.3 kg by the LL work group at the end of a 21-day stress period ($P < 0.05$). The loss of weight per kg and $\text{kg}^{.75}$ of initial live weight was 74 g. and 322 g respectively for LL group while it was 102 g and 457 g for HL group ($P < 0.05$). Also the design of the study helped to separate the weight loss due to dry season, curtailment in grazing time and work production (Table 2). Accordingly it was found that loss of weight due to work production *per se* was 17 kg in LL group and 27 kg in HL group.

Discussion

Livestock are a key component of the farming systems in the small holder sector of Zimbabwe (Shumba, 1985). They provide critical inputs for farming such as manure and draught power (GFA,

1987). However, frequent droughts and the resultant cattle mortality substantially decreased the availability of draught power during the past two decades (LeRoux, Stubbs and Donnely, 1978; Rusike, 1988; Tembo 1989). Further the prolonged dry season that precedes agricultural season leave the oxen weak at the onset of rains, a time when they are most needed for tillage work. Depending on the work schedule of the animals their grazing time is often curtailed which compounds the grazing stress. The change in body weight of work oxen during the season is due to the combined effect of dry season stress, curtailment in grazing time and work stress.

The loss of 43 kg of liveweight in HL group compared to 26 kg in LL group represents per cent and per cent of the initial liveweight of HL and LL groups respectively. The loss of weight per kg and $\text{kg}^{.75}$ of initial live weight was 74 g. and 322 g respectively for LL group while it was 102 g and 457 g for HL group ($P < 0.05$). The data indicate that lighter animals are more efficient in work production in terms weight loss for a given output of work, compared to heavier animals.

In Zimbabwe most of the smallholder farmers have Mashona cattle which weigh 250kg to 300kg at the end of dry season. Given that liveweight they should be turning out work with minimum weight loss. It is concluded that lighter animals are more efficient at ploughing than heavier animals in terms of weight loss for a given work output. In an environment where feed intake is limited this could be an advantage.

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