



A study on effect of work load on Physiological indices in donkeys

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ABSTRACT

The investigation was carried out to study the effects of draft load on physiological parameters (Temperature, pulse rate and respiration rate) in donkeys. Six male donkeys 4 to 5 years of age were subjected to loading exercise (i.e. 10% draft load for 1 to 5 days and 20% draft load from 6th to 10th day). ANOVA revealed a highly significant ($P \leq 0.01$) increase in

Temperature, pulse rate and respiration rate at 10% and 20% draft load.

KEYWORDS : : Draft load, donkeys, physiological value

Introduction

The donkey, *Equus africanus asinus*, is a domesticated member of the Equidae or horse family. They are the most important draught animal playing key role in the agriculture sectors in the developing countries in the form of pack transportation, carting, threshing, farm cultivation, riding, milk and meat production for human (Simenew, et al., 2011). It is imperative to know their physiological response during work to know the effect of work load and on their health. Variation on these parameters during work has been observed in earlier studies on cattle (Sastry et al, 1970), donkey (Pal et al., 2002), Mules (Srivastava et al., 2006) and Camel (Raghvendra et al., 2003).

Materials and Methods

Six apparently healthy adult medium-size Donkeys of 4-5 years of age were selected for study. Their body weight ranged between 120 to 150 kg. A Central Institute of Agricultural Engineering (CIAE) loading car was used to set the desired draught load for work. These animals were procured from the project scheme in National Research Centre on Equine, Jorbeer, Bikaner. These animals were provided with standard ration and water ad-libitum during the course of study. All the experimental animals were kept isolated from the rest of the Donkeys. They were provided clean housing and well ventilated sheds.

In the carting trail, pulling 10% load was tested continuously for a period of two hours. The physiological observation was recorded using standard techniques. The pulse rate was recorded by palpating the coccygeal artery for one minute. Respiration rate noted by counting the gushes of respired air at the back of the hand kept near the nostrils of the donkey for one minute. The

body temperature was recorded using a clinical thermometer inserted into the rectum for minutes. Care was taken to keep the bulb of thermometer in close contact with the rectal mucosa. Physiological parameters were recorded as per the standard procedure given in the Hawk's Physiological Chemistry (1976).

Results and Discussion

The mean \pm SE physiological parameters 10% and 20% draft load have been presented in table 1 and 2 .

Temperature pulse rate respiration rate at 10% and 20% draft load

The analysis of variance (ANOVA) revealed a highly significant ($P < 0.01$) effect of 10% and 20% draft load. The recorded Mean \pm SE control values of temperature, pulse rate, respiration rate of 10% and 20% draft load were more or less in accordance to the reported values of Srivastava et al., (2006 and 2009); Pal et al., (2002); Simenew et al., (2011) in different species of equine.

The reference range of physiological parameter (Rectal temperature, pulse rate, respiration rate) of mule are different from French et al., (1995); Feseha et al., (1994); due to difference in geographical condition, season or climate, age and physiological condition of animal.

The present study revealed that respiration rate, pulse rate and temperature increased significantly during the course of exercise at 10% and 20% draft load in mule. The observed trend of present study were compared and coincided with the finding of Pal et al., (2002); Srivastava et al., (2009) in different species of equine.

Pulse rate at 10% and 20% draft load

As per statistical analysis (ANOVA) revealed a highly significant ($P \leq 0.01$) effect of 10% and 20% draft load. The recorded Mean \pm SE control values of temperature, pulse rate, respiration rate of 10% and 20% draft load were more or less in accordance to the reported values of Srivastava et al., (2006 and 2009); Pal et al., (2002); Simenew et al., (2011) in different species of equine.

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Respiration rate at 10% and 20% draft load

As per statistical analysis (ANOVA) revealed a highly significant ($P \leq 0.01$) effect of 10% and 20% draft load. The recorded Mean \pm SE control values of temperature, pulse rate, respiration rate of 10% and 20% draft load were more or less in accordance to the reported values of Srivastava et al., (2006 and 2009); Pal et al., (2002); Simenew et al., (2011) in different species of equine.

Table 1: Mean \pm S.E. value of Temperature, Respiration rate and pulse rate according to the effect of 10% draft load in Donkey.

Phases	No. of Obs.	Temperature		Pulse rate		Respiration rate	
		Mean \pm S.E.	% Inc.	Mean \pm S.E.	% Inc.	Mean \pm S.E.	% Inc.
Control or Pre Exercise Condition(C)	6	98.10 \pm 0.10 (97.0-99.4)				25.6 \pm 0.443 (20.0034.00)	
After 2 hrs. Exercise(T ₁)	6	100.64 \pm 0.08 (100-101.2)	2.58%	50.166 \pm 0.98 (41.0058.00)	36.45%	47.533 \pm 0.554	85.66%
2 hour after rest (T ₂)	6	99.013 \pm 0.1 (98.0-100.2)	0.94%	42 \pm 0.820 (35.0-56.0)	14.44%	28.533 \pm 0.65 (22.0048.00)	11.44%

Note: Mean comparison have been made within different phases. Mean superscripted with different letters differ significantly ($P \leq 0.05$) from each other. Data shown in parenthesis are representing respective range.

Table 2: Mean \pm S.E. value of Temperature Pulse rate and Respiration rate according to the effect of 20% load in Donkey.

Phases	No. of Obs.	Temperature		Pulse rate		Respiration rate	
		Mean \pm S.E.	% Inc.	Mean \pm S.E.	% Inc.	Mean \pm S.E.	% Inc.
Control or Pre Exercise Condition(C)	6	97.91 \pm 0.08(96.698.4)		37.2 \pm 0.555 (32-44)		26.73 \pm 0.389 (22-30)	
After 2 hrs. Exercise(T ₁)	6	100.67 \pm 0.06 (100-101.3)	2.76%	51.9 \pm 0.733 (44-56)	39.51%	50.26 \pm 0.734 (44-56)	88.02%
2 hour after rest (T ₂)	6	98.62 \pm 0.167 (97-100.2)	0.72%	42.76 \pm 0.951 (34-50)	14.94 %	29.66 \pm 0.499 (24-36)	10.96%

Note: Mean comparison have been made within different phases. Mean superscripted with different letters differ significantly ($P \leq 0.05$) from each other. Data shown in parenthesis are representing respective range.

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