

The Effect Induced By Changing Of Conditions Of Maintenance And Exploitations of Draft Horses, Over Some Blood Parameters

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Abstract

Our study evaluates the effects of the changing of conditions of exploitations of draft horses, over some blood parameters. In this purpose were monitored 6 adult draft horses. Until the start of the experiment the horses were kept in home hibernal manure (800 m altitude). In spring the horses were transferred in the logging area. The tested parameters were evaluated four times. First (1st), evaluation was made immediately before the transfer of horses. The second evaluation (2nd) was made as soon as the horses arrived at the logging area (1000 m altitude). The third evaluation (3rd) was made after a week of intense work in logging area. The fourth evaluation (4th) was made after three weeks of intense work. Every evaluation blood samples were collected. RBC count, WBC count and N/L ratio were performed. The RBC values were significantly increased ($P < 0.05$) in 2nd(12.29 %), 3rd(7.66 %) and 4th(6.66 %) evaluations compared to 1st evaluation. This polycythemia represents an adaptive response to transport, hard work stress and altitude hypoxia. The WBC values were significantly increased ($P < 0.05$) in 2nd(28.5 %), 3rd(16.66 %) and 4th(14.52 %) evaluations compared to 1st evaluation. This leukocytosis seems to be an adaptive response to transportation and hard work stress. The N/L ration were significantly increased ($P < 0.05$) in 2nd(57.59 %), 3rd(51.30 %) and 4th(24.52 %) evaluations compared to 1st evaluation. According to these results, the horse transportation and logging work seems to be very stressful factors.

Keywords

transport stress; leukocyte; N/L ratio; horse

Introduction: Is well known that the changing in conditions of maintenance and exploitations is stressful to farm animals. All these stressors are able to induce haematological changes (Pruett, 2003). These changes were induced by two mechanisms: sympathoadrenal system, and hypothalamo-pituitary-adrenocortical axis (Tsigos, 2004). In stress response these mechanisms affects the number and proportion blood cells (Dhabhar, 1995; Glaser, 2005; Khansari, 1990).

Aim and objectives: The aim of this study was to evaluate the effects of the stress, induced by changing of conditions of maintenance and

exploitations of draft horses, over some blood parameters.

Materials and methods: 6 adult horses were used in our study. These horses were trained and usually used for logging. Until the start of the experiment the horses were kept in home hibernal manure (800 m altitude). In spring the horses were transferred in the logging area using a special designed trailer. The horses transfer lasted 2 hours. The tested parameters were evaluated four times. First (1st), evaluation was made immediately before the transfer of horses in the logging area. The second evaluation (2nd) was made as soon

as the horses arrived at the logging area (1000 m altitude). The third evaluation (3rd) was made after a week of intense work in logging area. The fourth evaluation (4th) was made after three weeks of intense work in logging area. The blood samples were collected from the jugular vein into heparinised plastic tubes. RBC and WBC counts were performed, using a manual haemocytometer method (Turk-Zeiss chambers). In this purpose we used dilutions (1: 200 and respectively 1:20) with Turk solution. The leukocyte formula and N/L ratio were determined. The blood smears were made on glass slides. These smears were stained with May-Grünwald and Giemsa. The stained preparations

were examined using light microscope and oil immersion lens objective. Two hundred leukocytes (neutrophils, lymphocytes, monocytes, basophils and eosinophils) were counted on each stained slide. The neutrophils/ lymphocytes ratio (N/L) was calculated and the means were calculated for each horse. The statistical significance of data was determined by the t test (Student). $P < 0.05$ was considered significant.

Results and discussion: Results on haematological determinations performed in horses, during the study period are given in next table:

Evaluation no.	RBC ($1 \times 10^{12}/L$)	WBC ($1 \times 10^9/L$)	N/L ratio
1	9.92	8.4	1.91
2	11.14*	10.8*	3.01*
3	10.68*	9.8*	2.89*
4	10.58*	9.61*	2.37*

* $P < 0.05$

The RBC values were significantly increased ($P < 0.05$) in 2nd(12.29 %), 3rd(7.66 %) and 4th(6.66 %) evaluations compared to 1st evaluation. This polycythemia represents an adaptive response to transport stress (2nd evaluation), hard work stress (3rd & 4th evaluation) and altitude hypoxia. The WBC values were significantly increased ($P < 0.05$) in 2nd(28.5 %), 3rd(16.66 %) and 4th(14.52 %) evaluations compared to 1st evaluation. This leukocytosis seems to be an adaptive response to transportation stress (2nd evaluation) and hard work stress (3rd & 4th evaluations). The N/L ration were significantly increased ($P < 0.05$) in 2nd(57.59 %), 3rd(51.30 %) and 4th(24.52 %) evaluations compared to 1st evaluation. N/L ratio is an objective indicator of stress (Davis, 2008). According to these results, the horse transportation and logging work seems to be very stressful factors.

Conclusion: The transport stress and hard work stress determined both, the increasing of RBC, WBC and N/L ratio in draft horses. The horse transportation and logging work seems to be very stressful factors, in horses.

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