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Edited by:

**Antonella Dalle Zotte**

**Alberto Brugiapaglia**

**Marco Cullere**

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# INFLUENCE OF SHORT-DISTANCE TRANSPORTATION ON WELFARE AND MEAT QUALITY OF HORSES WITH DIFFERENT HEALTH STATUS

Nikola Čobanović\*, Vesna Božić, Sara Kovačević, Ivan Vičić, Branko Suvajdžić, Nevena Grković, Mirjana Dimitrijević, Dragan Vasilev and Nedjeljko Karabasil

Faculty of Veterinary Medicine, University of Belgrade, Belgrade, Serbia

\*Corresponding author email: [cobanovic.nikola@vet.bg.ac.rs](mailto:cobanovic.nikola@vet.bg.ac.rs)

## I. INTRODUCTION

It has been demonstrated that long transportation could increase susceptibility to infection and triggering the onset of health problems in horses, such as transport pneumonia and gastrointestinal diseases [1–4]. However, there is no study reporting welfare and meat quality outcomes after short-distance transportation of slaughtered horses with different health status. Therefore, the aim of this study was to determine the effects of short transportation on blood metabolites and meat quality of slaughtered horses with and without lung lesions.

## II. MATERIALS AND METHODS

The experiment was performed on 115 mixed breed horses (mares) with average carcass weight of approximately 184 kg and about 3 years old originated from same farm. At exsanguination, blood samples were collected and blood lactate and glucose concentrations were determined within 10 minutes. Any signs of lung lesions (pneumonia and pleurisy) were recorded at the slaughterline as present or absent. pH and temperature of *Musculus longissimus dorsi* ( $pH_{MLD45min}$ ;  $T_{MLD45min}$ ;  $pH_{MLD24h}$ ;  $T_{MLD24h}$ ) and *Musculus gracilis* ( $pH_{MG45min}$ ;  $T_{MG45min}$ ;  $pH_{MG24h}$ ;  $T_{MG24h}$ ) were measured 45 minutes and 24 hours postmortem. Instrumental colour, drip loss, thawing loss and cooking loss were measured in *Musculus longissimus dorsi*. Statistical analysis of the results was conducted using software SPSS version 23.00 for Windows. According to the presence of lung lesions, the slaughtered horses were allocated to two groups: (i) the group of slaughtered horses without lung lesions ( $n = 70$ ) and (ii) the group of slaughtered horses with lung lesions ( $n = 45$ ). Student t-test was used to examine the differences between two groups in the blood metabolites and meat quality parameters. Data were described by descriptive statistical parameters as the mean value and pooled standard error of means – SEM. Statistical significance was accepted at  $P < 0.05$ , while tendencies were accepted at  $0.05 < P < 0.10$ .

## III. RESULTS AND DISCUSSION

The effects of short-distance transportation on the blood metabolites and meat quality parameters of horses with different health status are shown in Table 1. Slaughtered horses having lung lesions had higher tendency towards elevated blood lactate concentration, implying their higher susceptibility to stress and greater fatigue after short transportation. In addition, slaughtered horses showing lung lesions had significantly lower pH value measured 45 minutes in *Musculus longissimus dorsi* and higher cooking loss, indicating lower meat quality.

Table 1 The effects of short-distance transportation on the blood metabolites and meat quality parameters of horses with different health status

Item	No lung lesions	Lung lesions	SEM	P - value
Number of horses	70	45		
<i>Blood metabolites</i>				
Lactate (mmol/L)	8.0	10.3	1.13	0.0634
Glucose (mmol/L)	5.4	5.7	0.21	0.1267
<i>Meat quality traits</i>				
pH <sub>MLD45min</sub>	6.7	6.6	0.04	0.0246
T <sub>MLD45min</sub>	33.4	33.7	0.67	0.6865
pH <sub>MLD24h</sub>	5.7	5.7	0.04	0.3088
T <sub>MLD24h</sub>	3.7	3.7	0.35	0.8284
pH <sub>MG45min</sub>	6.5	6.4	0.07	0.1226
T <sub>MG45min</sub>	35.5	3.5	0.57	0.5824
pH <sub>MG24h</sub>	5.7	5.7	0.04	0.4322
T <sub>MG24h</sub>	5.7	6.6	0.84	0.2791
Drip loss (%)	1.9	1.9	0.20	0.8711
Thawing loss (%)	7.7	7.7	0.62	0.9497
Cooking loss (%)	24.1	26.5	0.97	0.0191
L* value	32.2	31.6	0.52	0.2524
a* value	10.6	11.0	0.37	0.2554
b* value	6.7	6.5	0.94	0.8274

#### IV. CONCLUSION

The results of this study showed higher sensitivity to stress and lower meat quality traits in slaughtered horses with lung lesions. Further research is necessary to determine the effects of presence and severity of lung lesions in slaughtered horses on biochemical indicators, growth performance and carcass and meat quality and to determine their potential causal effects.

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