

## STUDIES CONCERNING SHEEP WELFARE DURING ROAD TRANSPORTATION

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### Introduction

Studying the effects during road transportation on sheep welfare has imposed like a necessity in the new context of harmonizing the legislation of our country with the European Union. The study has followed animal behaviour during the travel and then measuring some physiological and biochemical indicators.

### Material and Methods

The study was made on an adult sheep, transported autumn with vehicles for animal transportation from a farm in the north of the country to an export base in south east of the country. The journey last to 16 hours. Before embarkment the animals were identified, clinic examined, then were weighing, thermometer and was measured the skin thickness. Each sheep was applied intravenous catheter that maintained 24 hours. For putting in evidence the metabolic and physiological modifications that appeared during transport, were cropped blood proofs 2 hours before embarkment then after departing at 2, 4, 8, 12 hours at the destination (16 hours) and at 24 hours from departing. In all this time was followed the evolution of some physiological and biochemical indicators like the cardiac frequency, the body temperature, the animal weight, the size of the skin thickness, plasmatic cortisol, free fatty acids, urea and creatine phosphokinase. The remaking of proofs was made at destination by the RIA method, optic test, Novak colorimetric method and urea method.

### Results and Discussions

Sheep transport with vehicles in optimal conditions, represents a factor of moderate stress comparative with shearing that is considerate a major stress to these.

In this use the searching has followed the animal answer like a reaction of adaptation at transport determined by the measuring of the plasmatic cortisol. The high level of this was at 2 hours from embarkment that shows the fact that this operation is stressing for sheep's causing the increasing of plasmatic cortisol till  $54\mu\text{g/l}$  instead of  $27,6\mu\text{g/l}$  measured before embarkment. After 2 hours since departure the level of plasmatic cortisol reached the maximum value after this register a progressive diminution of this maintaining then constantly (fig. 1). This thing proves that after a period of adaptation of sheep's at the transport condition, it becomes a moderate stressor ( $>30\mu\text{g/l}$ ).

Also, was noticed that because of no foddering during 16 hours of travel, there is an acceleration of protein catabolism that has as result the increasing of urea (fig.2).

The metabolic changing at sheep's during transport is significant and constant on a large period of time. This can have at least important causes stress, no foddering and limited animal movement. Till 80% of metabolic energy necessary to sheep's is from free fatty acids made at rumen level.

These are represented by acetate, propionate and butyrate. Propionate is transported at liver level and converted in oxaloacetat and glucose. From metabolic energy approximately 20% is obtained by oxidation of the acetate a

part of it is stored in glucose. If there is no foddering fatty acids volatile don't produce anymore and using of acetate like energy source is about 2%. The continuation of glucose that is still used like an energy source until the existent store in the shape of hepatic glycogen is flat after 24 hours in general. In these conditions the plasmatic glucose, plasmatic acetate and plasmatic free fatty acids are used like an energy source for musculature. Free fatty acids come near glycerol by plasmatic trigliceride of lionize phenomena. If hunger is extensional and oxaloacetat and betahidroxiturat has limited quantity appears ketogenesis followed by the increasing of plasmatic level of acetoacetat and betahidroxiturat.

### Conclusions

- 1.The plasmatic cortisol level touches the maximum value after 2 hours from embarkment and maintains constantly reason that sheep's journey can be considered a moderate stressor.
- 2.The level of some free fatty acidic and the plasmatic urea increased because of the animal hunger and metabolic energy resources limited.
- 3.During sheep transport with vehicles 16 hours time there is noticed the increasing of cardiac frequency as well as the corporal temperature.
- 4.Because of the dehydration, there was noticed a diminution of the thickness.

### References

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Fig.1. The plasmatic cortisol evolution during transport of sheep

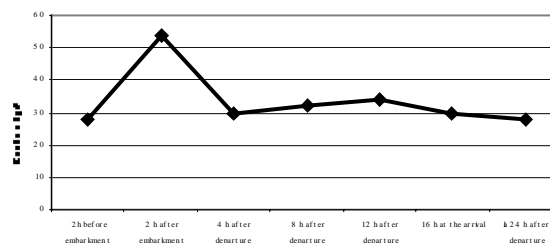


Fig.2. The urea evolution during transport of sheep

