

Pulse rate at an emotional stress in farm animals as feature of their highest nervous activity

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Animals with high mobility of nervous processes are able to quickly and adequately respond to the braking effect, which gives them a better adaptation to environment conditions. According to Meerson (1981) in the formation of conditioned reflexes emotional stress that occurs under the influence of significant changes in the environment plays an important role. The first stage of formation of a conditioned reflex was designated by Pavlov (1951) as a generalization stage. In this period the organism responds not to one specific stimulus, but on many relatives or even stimulus far from it and this answer is characterized by the generalized motor response, accompanied by large shifts of the blood circulation, breath and other "vegetative" functions. In this regard the study of heart rate variability in farm animals as a response to emotional stress is of great scientific and practical interest. The response of the animals to the stimulus has a specific and individual differences, as shown by our experiences.

In our studies (Tayshin, 1986; Tayshin, Rudneva, 1992) it was found that higher the resistance to a stressor "foreign milkmaid" at Simmenthal cows accompanied by decreased cases of the mastitis, along with increased rates of lactation and milk productivity. These studies provide the basis of our hypothesis of influence of an emotional stress on heart rate, and that these changes allow to conclude on types of higher nervous activity in farm animals.

Yaks, cattle, sheep and horses of a mountain-taiga zone of Buryatia selected by random sampling technique were chosen as objects of study (Tayshin, et al., 1993). Each experimental group was 20 animals (including on 10 young animals).

During the first minute of an emotional stress response experimental animals have increased heart rate, which reduced in horses and sheep for 5 minutes by 29,1 and 10,1%, respectively. Horses had a heart rate above physiological norms, which returned to normal value after only 5 minutes. However, the intragroup variability increased by 1.8%, that in our opinion can be explained by existence in this group of individual animals with a more pronounced excitative process. Thus, pulse rate at a horse No. 12 on the first, third and fifth minutes was 58, 58 and 56 beats per minute, respectively.

Pulse rate at an emotional stress in adult animals

Species of animals	Exposure time		
	first minute	third minute	fifth minute
Yaks	48,6±2,2	52,1±1,7	59,2±1,7
Cattle	68,2±2,6	65,0±1,8	40,2±1,1
Horses	55,1±0,9	52,3±1,1	65,0±1,08
Sheep	72,3±0,89	70,4±1,13	54,5±1,3

In the first minute of an emotional stress it was found clear interspecies difference between yaks and cattle.

The difference was 40,3%. Animals of experimental groups inadequately reacted to a stress-factor that affected intra-group variability of pulse rate. Pulse rate of yaks from first to fifth minute increased for 12,1%, whereas cattle's pulse decreased by 13,2%. These data allow us to suggest that under emotional stress yaks characterized by increased excitation that result in elevated heart rate. Cattle stress reaction is characterized by domination of inhibitory processes and reduced heart rate.

Similar changes of pulse rates under emotional stress conditions were detected in young animals. Therefore, on nature of change of pulse rate it is possible to specify features of the highest nervous activity at yaks, horses, cattle and sheep.