

# **CONTENT OF SATURATED FATTY ACIDS IN BLOOD PLASMA OF PIGLETS DEPENDING ON THE FEATURES OF CORTICAL AND AUTONOMIC NERVOUS REGULATION**

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The results of studies of fatty acid lipid spectrum of blood plasma in piglets depending on the characteristics of conditioned reflex activity and type of autonomic regulation are shown in the article.

The purpose of the study was to examine the content of saturated fatty acids in plasma lipids of piglets depending on the types of higher nervous activity and tone of the autonomic nervous system.

Experiments were carried out on clinically healthy piglets of large white breed 4–5 months of age in 2014 year. Type of higher nervous activity in piglets was determined using rapid method developed by the Department of Animal Physiology, Pathophysiology and Immunology of NULES of Ukraine. According to the studying of conditioned reflex activity it was formed 4 experimental groups, 3 animals in each. The first group consisted of animals of strong, balanced and mobile, the second – a strong balanced inert, the third – a strong unbalanced, the fourth – the weak types of higher nervous activity. Then in animals of experimental group we studied the tone of the autonomic nervous system using trygemino-vagal test, by the results of which we determined the type of autonomic regulation and, therefore, the animal were treated to normotonics, sympathicotonics or vagotonics. For biochemical studies the blood samples were taken from the cranial vena cava in compliance with the rules of aseptic and antiseptic. Blood plasma was obtained from heparinized blood by centrifugation at 1000 x g for 10 min. Fatty acid lipid spectrum of blood plasma was determined by gas chromatography. Lipid saturation index was determined as the ratio of saturated to unsaturated fatty acids. The results were treated in accordance with generally accepted statistical methods using Student's t-test.

When studying the percentage of fatty acids the certain differences were found between animals regardless of its affiliation to a particular type of higher nervous activity. The highest saturation index of plasma lipids was observed in piglets of weak types of higher nervous activity, while the lowest – in piglets of strong, balanced and mobile type.

In piglets of strong, balanced and mobile type of higher nervous activity the sum of saturated fatty acids in plasma lipids was lower by 4.3% ( $P < 0.01$ ) than in piglets of weak type. Animals of strong, balanced and mobile type of higher nervous activity were characterized by significantly lower content of palmitic (C 16:0),

heptadecanoic (C 17:0) and stearic acids (C 18:0), while the content of myristic (C 14:0) and arachic acids (C 20:0) was significantly higher compared with the animals of weak type.

In animals of strong balanced inert type of higher nervous activity the sum of saturated fatty acids in plasma lipids was higher by nearly 3 % than in animals of strong, balanced and mobile type. Found that piglets of strong balanced inert type of higher nervous activity have significantly higher content of arachic acid (C 20: 0) in plasma lipids than the animals of weak type.

In piglets of strong unbalanced type of higher nervous activity the sum of saturated fatty acids in plasma lipids was almost the same as in piglets of strong, balanced and mobile type, but lower by 3.5 % compared with piglets of weak type. Animals of strong unbalanced type of higher nervous activity had significantly lower content of palmitic (C 16:0) and significantly higher content of arachic acids (C 20:0) in plasma lipids than animals of weak type.

When comparing the ratio of saturated to unsaturated fatty acids in plasma lipids of piglets with different types of vegetative homeostasis the substantial differences were not found. The saturation lipid index in blood plasma of piglets was 0.51–0.56. Found that piglets normotonics had significantly higher content of myristic acid (C 14: 0) in plasma lipids compared with sympathicotonics. As for the rest of the saturated fatty acids, the significant differences were not found in piglets depending on the type of vegetative regulation.

Thus found that according fatty acid lipid spectrum of blood plasma there are differences between piglets of different types of higher nervous activity. Reliable differences both by fatty acids factions, and the content of saturated fatty acids were observed between animals of strong balanced mobile and weak types of higher nervous activity. In piglets with different tone of autonomic nervous system significant differences by the sum of saturated fatty acids in plasma lipids were not observed. However, it was found significantly higher levels of separate saturated fatty acids in in blood plasma of animals normotonics compared to sympathicotonics.