Lipid Exchange in Serum During Metabolic Syndrome in Dogs, Depending on Temperature of Their Keeping

A.O. Zemlyansky
Luhansk National Agrarian University, Kharkiv, Ukraine

The metabolic syndrome is a polymorbid pathology, which is common among populations in many countries [P.W.F. Wilson, 2005; A.V. Sirusina et al., 2013]. In recent decades the cases of metabolic syndrome have been described in domestic animals, in particular, horses, cows, pigs, domestic cats [V.N. Tikhonov et al., 2011; MA Koval’eva et al., 2012; A.G. Nezhdanov et al., 2016]. Pathogenic factors include hypodynamics, high calorie, unbalanced nutrition and oxidative stress.

Metabolic syndrome in animals is diagnosed on the basis of anamnestic, clinical, laboratory and special research methods [E.V. Iovdalskaya, 2013]. However, there is a lack of information on the effect of low temperature on development and course of metabolic syndrome in domestic animals, in particular in dogs. The research aim was to study the effect of temperature on clinical and laboratory parameters of dogs with an increased body mass index.

In this research the anamnesis data, routine clinical, biochemical methods and instrumental studies were used, in particular, the serum levels of triacylglycerols, total cholesterol and lipoprotein fractions were determined.

The 7–10-year-old outbred male dogs with a live weight of 10–15 kg were examined. The first group of animals \( (n = 15) \) was kept at room temperature of 19–22°C. All the dogs had an elevated body mass index, which is one of the criteria for metabolic syndrome. The diet was mixed. The survey was conducted in early April.

In animals of group 1, the signs of a metabolic syndrome have not been revealed: absence of an increase in blood glucose content of glucose, uric acid, lipidograms, liver tests, and the results of clinical blood tests were normal. In dogs of group 2, against the background of the raised body weight, typical signs of a metabolic syndrome were revealed: leukocytosis, erythrocytopenia, elevated liver tests, high levels of uric acid and total cholesterol (1.7 times), triacylglycerols (2 times), high cholesterol lipoprotein density (1.5 times), low density (3.2 times), very low density (2.3 times), compared with the indices in animals of group 1.

Thus, in cold-adapted dogs despite of their excess body weight no metabolic syndrome was developed.