EFFECT OF DIETARY PROBIOTIC *PEDIOCOCCUS ACIDILACTICI* MA 18/5 M AND PREBIOTIC MANNANOLIGOSACCHARIDES AND THEIR COMBINATION ON CAECAL PARAMETERS IN HENS

Zenon Zdunczyk[1], Romas Gružauskas[2], Jerzy Juskiewicz[1], Agila Daukšienė[2], Asta Racevičiutė-Stupelienė[2], Virginija Jarulė[2]
[1]*Institute of Animal Reproduction and Food Research of Polish Academy of Sciences*
Tuwima 10, 10-747 Olsztyn, Poland, Tel. +48 89 5234671, Fax. +48 89 5240124, E-mail: zez@pan.olsztyn.pl
[2]*Veterinary Academy of Lithuanian University of Health Sciences*
Tilžės 18, LT-47181, Kaunas, Lithuania

Abstract. The aim of experiment was to investigate the physiological response of caecal ecosystem of laying hens to supplementation of a diet with probiotic or prebiotic preparations and with both of these additives. The experiment was conducted on 4 groups of laying hens, with 10 birds each, for 4 weeks fed standard diets with added probiotic preparation (Bactocell, containing *Pediococcus acidilactici*) and mannan-oligosaccharide (MOS), given as prebiotic preparation (Agrimos). The dietary treatments did not affect the analyzed caecal parameters: relative weight of tissue and digesta, dry matter concentration, and pH value of caecal digesta, but affected caecal ammonia level the activity of selected microbial enzyme. Dietary combination of Bactocell and MOS increased activity of α-glucosidase, α-galactosidase and β-galactosidase activity ($P<0.05$ *versus* other groups), and decreased β-glucuronidase activity (significantly in comparison to the control group). The lowest β-glucuronidase activity was observed upon a single MOS addition ($P<0.05$ *versus* control and probiotic treatments). Ammonia level was significantly lowered by mannan, as a single supplement and in combination as well ($P<0.05$ *versus* control and probiotic groups). As compared to the control group a single probiotic treatment increased concentration of acetate and total SCFA, while the applied combination of probiotic and MOS increased proportion of propionate, with simultaneously decrease in proportion of butyrate in the SCFA profile. It could be concluded that, along with the desired action in the caeca of hens as compared to the control birds, a dietary combination of applied probiotic strain with prebiotic MOS beneficially reduced caecal ammonia concentration and β-glucuronidase activity (*versus* single probiotic group) as well as increased propionate concentration (*versus* single prebiotic dietary treatment).

Keywords: probiotic, prebiotic, caecum, hens.