Influence of *Dermanyssus gallinae* (poultry red mite) invasion on the plasma levels of corticosterone, catecholamines and proteins in layer hens

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**Abstract**

The results of studies conducted in 2006 revealed that mass red mite (*Dermanyssus gallinae*) invasions cause somatic stress which may be responsible for the pathophysiological mechanism of decreased egg production, lower humoral immunity and higher mortality in layer hens. The aim of this study was to validate the above research results, to investigate whether in addition to somatic stress, red mite invasions cause psychogenic stress due to the activation of the sympatho-adrenomedullary system, and to determine the level of stress resulting from red mite infestations in comparison with a short, 1.5 h period of acute immobilisation stress.

The study investigated 36 HY-Line Brown layer hens divided into three groups: a non-infested control group, an experimental group infested with red mites and a non-infested experimental group subjected to acute immobilisation stress for 1.5 h. Blood samples were taken from all hens for the determination of the levels of corticosterone, adrenaline, noradrenaline, albumin, and α-, β- and γ-globulins.

The results validated the previous reports on the occurrence of somatic stress and on a significant decrease in γ-globulin levels (p ≤ 0.01) in the group of birds infested with red mites, in comparison with the control group. Adrenaline levels in infested hens were indicative of psychogenic stress. Based on a comparison of hormonal indicators in all hen groups, the level of somatic stress resulting from red mite infestation can be classified as moderate, while the level of psychogenic stress can be interpreted as high. A significant drop in γ-globulin levels in the blood of birds infested with red mites also shows that the invasion induces chronic stress which lowers the humoral immunity of hens.

**Key words:** *Dermanyssus gallinae*, poultry red mite, laying hens, stress