

HETEROPHIL LYMPHOCYTE RATIO AS A MEASURE OF STRESS IN TWO STRAINS OF CHICKEN

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Reduction in the number of circulating lymphocytes, increase in the number of heterophils and reduction in the weight of lymphoid tissues under stress conditions are well documented (Siegel and Gross, 1965; Siegel, 1981 and Gross and Siegel, 1983). The ratio of the heterophil to lymphocyte is taken as a constant called stress index. Based on the above observations, an experiment was designed to study the effect of thermal stress in two strains of white leghorn, maintained in individual cages and in deep litter. The study was conducted during peak summer months when there was continuous thermal stress on the birds.

Materials and Methods

Twelve numbers of seven month old white leghorn birds of two strains, IWN and IWP, maintained in cages and deep litter were utilized for the study. All the birds were maintained in the same location and were fed on the same layer ration. The temperature inside the houses were recorded. Blood smear was made on clean grease free slides after venipuncture. The slides were stained with Leishmans-Geimsa method as described by Sastry (1983). The data were analysed statistically using student's 't' test.

Results and discussion

The temperature inside both the houses was 36° C. The mean Heterophil/Lymphocyte

(H/L) ratio of IWP and IWN strains in cages and deep litter are shown in Table 1.

Table 1 Mean H/L ratio of IWP and IWN strains in cages and deep litter

House	IWP	IWN
CAGE	1.91±0.37	2.34±0.05
DEEP LITTER	0.58±0.06	0.65±0.11

Levels of significance

P< 0.001 (between IWP cage and deep litter)

P< 0.001 (between IWN cage and deep litter)

P< 0.01 (between cage IWN and IWP)

P< 0.5 (between deep litter IWN and IWP)

The results indicate that the H/L ratio has significant difference in the cage and in the deep litter systems. The observation also emphasizes the findings of Gross and Siegel (1983) that H/L ratio is a sensitive index of the stress factor. Heat stress was found to be more in the cages as evident from the high H/L ratio compared to that in the deep litter. The high H/L ratio is an indicator of the need for adopting vigilant management measures to avoid heat stress in the cage system.

The ratio also shows that IWP strain is more capable of withstanding the heat stress when compared to IWN strain. Birds capable of tolerating the stress conditions will have better immune status as evident

from the H/L ratio. They will be more resistant to infections and capable of better production performance.

Summary

The H/L ratio was studied in IWN and IWP strains of white leghorn maintained in cage as well as deep litter. The birds were under heat stress due to the peak summer temperature of 36°C. The study conducted in twelve birds showed that the H/L ratio can be an indicator of stress.

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