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## Relationship between plasma GH, metabolites, lipogenic genes and MMP3 expression in different tissues of PD3 chicken line during summer season and role of fermented yeast culture in alleviating heat stress

The present experiment was conducted for eight weeks to observe the effect of high ambient temperature prevailing during month of April and May in summer season on growth hormone (GH), metabolites, expression of lipogenic and matrix metalloprotein genes in different tissues. It was hypothesized that supplementing fermented yeast culture (Commercial, Unigrow), to chickens (pullets) during summer may alleviate heat stress by having an effect on growth hormone, metabolites and on expression of genes. The effect of high ambient temperature on circulatory GH is not known. Three groups of birds (PD3 line) were taken whose average body weight at 17 weeks of age was 950g. One group served as control which did not receive any dose of supplement (FYC), the other two groups were supplemented with 0.5g/kg and 1.25g/kg of feed. The control group was offered feed ad libitum. Feed intake and Body weight were recorded at weekly intervals. Blood was collected at weekly intervals; plasma was separated and stored for estimation of hormone and metabolites. Relative expression of genes was conducted for liver, hypothalamus and magnum portion of the reproductive tract. It was observed that, during summer season, the concentration of GH in the T2 was significantly ( $P < 0.05$ ) higher in the control

group, but was not significantly different when compared with the T1 group. The expression of SCD, FAS lipogenic genes and MMP3 genes was higher in the control group when compared with the T2 group. However, the expression was not significantly different when compared with the T1 group. Disturbance of lipogenesis occurs as a result of up regulation of hepatic lipogenic enzymes through an increase in mRNA gene expression level of these enzymes (Peiet al., 2009). The concentration of metabolites, cholesterol and melanoaldehyde (MDA) were also higher in the control group. It is reported by Lin et al. (2010), that heat stress causes increase in plasma MDA levels.  $\beta$  glucans present in the yeast cell wall have cholesterol lowering effects (Zekovic et al., 2005). Fermented yeast culture is a source of less number of live yeast cells and other factors like vitamins, minerals and amino acids. Hence the results indicate that higher ambient temperature increases the concentration of GH hormone, cholesterol, MDA, expression of lipogenic and matrix metalloproteinase genes in different tissues of chickens during prelaying period and supplementation of higher dose of FYC decreases the level of hormones, metabolites and expression of genes. The supplement may be able to alleviate the effect of heat stress.

### Biography

N Anand Laxmi is working as Principal Scientist, in Directorate of Poultry Research, Rajendranagar, Hyderabad, India. She was working earlier as Principal Scientist, at National Dairy Research Institute Karnal, Haryana, India. Her field of specialization is Endocrinology and Reproductive physiology. She has expertise in cell culture. She has authored research papers in reputed National and International Journals.

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