

The effect of light and darkness on acclimatization of laying hens

ABSTRACT

Laying hens kept in different light and dark periods of the day at high ambient temperature of maximum 35°C were challenged to 38.5±0.5°C acute heat 3 hours daily for 7 consecutive days. They were found to have a significant ($p<0.01$) acclimatization response (rectal temperature) to heat stress during the dark period compared to those exposed to the same temperature during the light period. The blood pH was not significantly different. The partial pressure of carbon dioxide (PCO₂) was significantly high ($p<0.01$) except in day 4. Similarly the blood bicarbonate (HCO₃⁻) concentration was significantly high ($p<0.05$) except day three and day four. Acute heat exposure in the first day increased the body temperature in both groups (Light and Dark) reaching 44°C, followed by gradual reduction in body temperature. The dark treated birds showed rapid reduction in body temperature (42.88°C) and adaptation to high temperature during days 2-4 but that this was lost to some extent in days 6-8. However this was not obvious in the light treated birds. It is concluded that darkness reduce hyperthermia and enhance acclimatization responses during acute heat stress.

Keyword: Acclimatization; Darkness; Heat stress; Hyperthermia; Light