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ABSTRACT

Effect of summer heat environment on body temperature, estrous cycles and blood antioxidant levels in Japanese Black cow.

Sakatani M [1], Balboula AZ, Yamanaka K, Takahashi M.

[1] Kyushu Okinawa Agricultural Research Center, National Agriculture and Food Research Organization, Koshi, Kumamoto, Japan. msaka@affrc.go.jp

This study investigated the effect of summer heat environment on estrous cycles and blood antioxidant levels in Japanese Black cows. A total of 13 non-lactating Japanese Black cows (summer: 9, winter: 4) were examined. Body temperature was measured rectally and intravaginally using a thermometer and data logger, respectively. Estrous behavior was monitored using a radiotelemetric pedometer that recorded walking activity. Rectal temperatures were higher during summer than winter ($P<0.001$). There was an acute increase in vaginal temperature at the onset of estrus during winter but such an increase was not observed during summer. Walking activity during estrus decreased dramatically in the summer compared to the winter. Duration of estrous cycle was longer in summer (23.4 days, $P<0.05$) than winter (21.5 days), and the subsequent rise in progesterone concentrations following estrus tended to be delayed in summer. The level of thiobarbituric acid reactive substances (TBARS) in peripheral blood cells was higher during summer ($P<0.05$), while the levels of superoixde dismutase (SOD), glutathione peroxidase (GPx) and glutathione were lower ($P<0.05$). These results indicate that high ambient temperature during summer increases both body temperature and oxidative stress, and also reduces signs of estrus in Japanese Black cows.

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