

The effect of temperature-humidity index on semen production of male New Zealand rabbits ⁽¹⁾

Pei-Chun Tsai ^{(2) (4)} and Ting-Chieh Kang ⁽³⁾

Received: Jul. 10, 2023; Accepted: Mar. 19, 2024

Abstract

The purpose of this study was to compare the effects of temperature-humidity index (THI) on the semen production of New Zealand rabbits, as an indicator of heat stress in rabbits. The average THI of rabbit houses in Taiwan Livestock Research Institute during the cool season from November to April was 20.3 ± 2.5 , and the average THI in the hot season from May to October was 27.6 ± 3.6 . Analysis shows that when THI was higher than 27.8, rabbits suffered heat stress during 37.6% of the time. The weaning weight of male rabbits in cool season was $1,001.3 \pm 80.5$ g, which was significantly higher than that of 777.4 ± 109.0 g in hot season ($P < 0.05$). Moreover, the frequency of mating behavior in male rabbits in cool season was $100.0 \pm 0.0\%$, which was significantly higher than the $85.7 \pm 7.6\%$ in the hot season ($P < 0.05$). The examination results of the semen traits of New Zealand male rabbits in the cool season and hot season showed that there was no significant difference in the parameters of semen volume, sperm concentration, vitality/mortality rate, and progressive motility, but the sperm motility during the cool season was $69.3 \pm 10.5\%$, which was significantly better than that in the hot season ($46.5 \pm 13.6\%$) ($P < 0.05$). The comparison of testicular tissue sections showed that continuous high temperature in the environment affected spermatogenesis in male rabbits. In summary, continuous high temperature decreases sexual desire, testis spermatogenesis and sperm motility in male rabbits, which could also be the reason for the decrease in male rabbit fertility in the summer.

Key words: New Zealand White rabbit, Semen production, Temperature-Humidity Index (THI).

(1) Contribution No. 2784 from Taiwan Livestock Research Institute (TLRI), Ministry of Agriculture (MOA).

(2) Genetics and Physiology Division, MOA-TLRI, Tainan 71246, Taiwan, R. O. C.

(3) South Branch, MOA-TLRI, Pingtung 94644, Taiwan, R. O. C.

(4) Corresponding author, E-mail: pctsai@mail.tlri.gov.tw.