



Growth Performance and Reproductive Traits at First Parity of New Zealand White Female Rabbits as Affected by Heat Stress and Its Alleviation under Egyptian Conditions

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ABSTRACT

Exposing growing and adult New Zealand White (NZW) female rabbits to severe heat stress (temperature–humidity index = 28.9) during summer adversely affected their growth and reproductive traits. The traits that declined significantly ($p < 0.01$) were the live body weight, daily weight gain and feed intake of growing rabbits, and the litter size and litter weight at weaning ($p < 0.05$) and the pre-weaning weight gain of pups ($p < 0.01$) for adult females. The conception rate declined considerably with heat stress. The declines in the values of the digestibility coefficients due to heat stress were 7.9% ($p < 0.05$) for dry matter (DM), 8.1% ($p < 0.05$) for crude protein (CP) and 1.0% for crude fibre (CF). The traits that increased significantly ($p < 0.01$) due to heat stress were water intake, water/feed ratio and rectal temperature in growing rabbits and pre-weaning mortality for adult females.

Alleviation of heat stress in the growing and adult female NZW rabbits was more efficient with drinking cool water (10–15°C; between 10:00 and 17:00) than with supplementation with palm oil (as a source of energy) or natural clay (as a natural enhancer to growth and milk production). Supplying the animals with cool drinking water gave the highest body weight and weight gain, conception rate, litter size and weight and digestibility coefficients for DM and CP and the lowest rectal temperature, respiration rate and pre-weaning mortality.

The loss in rabbit production pertaining to heat stress estimated from the percentages of decline in conception rate \times pre-weaning mortality \times litter weight at weaning was 73.0%. The provision of cool water restored 11/12 of heat loss.

Keywords: clay, climate, digestibility, growth rate, heat stress, mortality, palm oil, rabbit, reproduction, season, water

Abbreviations: CF, crude fibre; CP, crude protein; DE, digestible energy; DM, dry matter; NZW, New Zealand White; THI, temperature–humidity index

INTRODUCTION

In hot climates the breeding season of rabbits is limited. In the Northern hemisphere, it normally begins in September and ends in May each year owing to the detrimental effects of summer conditions on growth and reproduction (Marai *et al.*, 1996). The most obvious limitation on rabbit production in such areas is their susceptibility to