

ABSTRACT

This study was carried out at Sids Research Station, Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture, Egypt in cooperation with Animal Production Department, Faculty of Agriculture, Fayoum University, throughout the period from July, till September. The present study aimed to alleviate the negative effect of Egyptian hot summer conditions by using nutritional means including addition of each of *Nigella sativa* seeds, Ginger, Curcumin and electroletes. Also, to asses and evaluate the impact of these means on the physiological and reproductive performance, particularly semen characteristics of Ossimi rams.

15 healthy mature Ossimi rams, with an average body weight of 67.5 kg and average age of 2-3years, were equally divided into 5 groups. Rams were unsupplemented with only of the following additions and served as control group (G1), Rams either received NSS (100mg/kg BW) (G2), or ingested Curcumin 100mg/kg BW (G3), or ingested Ginger100mg /kg BW (G4) while the last group ingested (0.5% NaHCO₃ + 0.5% K₂CO₃) (G5). Thermoregulatory responses (RT, ST and RR) were recoded. Serum metabolites (TP, Alb, glob, TC, Glucose and triglycerides) and hormones (T3, T4 and Testosterone) were determined. Reproductive performance and semen characteristics were estimated. The average THI over the study period was 93.85.

It could be indicated that treating rams with medicinal herbs or electrolytes improve thermoregulatory where they significantly reduced RT, ST and RR. The best result was for NSS. Moreover, medicinal herbs and electrolytes increased ($p \leq 0.05$) serum glucose, TP and Glb while Alb levels were not affected by NSS or Cur. Furthermore, treating heat stressed- rams with medicinal herbs and electrolytes led to a reduced serum TC and TG and increased thyroid hormones and T levels.

Ejaculate volume, Sperm cell motility%, Sperm cell concentration/ml or/ejaculate, Sperm motility and sperm motility/ejaculate were increased as a result of supplying medicinal herbs or Electrolytes, where motility% were increased by 12.25, 9.93, 10.56 and 9.45% by using NSS, Cur, Gin, and Electro., respectively comparing to control. In addition, significant reductions have been shown in the percentage of abnormal sperm in all treated rams compared to the control group. Scrotal circumference and Length of Urethral process were larger in treated rams.

Finally, medicinal herbs and electrolyte could be used effectively to ameliorate heat stress in rams during hot climates and improve most of semen characteristics.

Key words: Rams, heat stress, *Nigella sativa*, Curcumin, ginger, electrolytes, semen