

Shading effects on physical and biochemical parameters in Tunisian local goat kids during hot season

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62nd Annual Meeting of European Association for Animal Production. Stavanger, Norway, Aug 29 – Sept 2, 201

INTRODUCTION

The goat is one of the principal sources of meat and milk in Tunisia. The total national population is estimated at about 800,000 goats, 90% of which are local goats reared in the arid and desert areas of the country.

Under arid and desert climate, it is expected that animals are in poor conditions and suffer reductions in reproduction and production performances. However, indigenous species such as goats are more adapted to the harsh conditions, especially high temperatures during summer.

This study aimed to investigate the effects of shading on physical and biochemical parameters in Tunisian local goat kids during hot season

MATERIALS & METHODS

■ Fourteen female kids (6.5 ± 0.9 mo; 10.8 ± 1.5 kg) were randomly assigned to 2 groups during **august**:

Group 1: exposed to daytime **solar radiation**.

Group 2: maintained **under shade**.

■ The following parameters were recorded:

Respiratory rate recorded per minute 3 times weekly at 10, 13, and 16 h.

Rectal temperature 3 times weekly at 10, 13, and 16 h.

Body weight gain.

Water consumption and DMI.

Blood protein, glucose and urea were determined weekly.

■ Data were analyzed by **PROC MIXED** of SAS. The model included the **shading effect** and **day hour**. **Pearson coefficients** were calculated between ambient temperature, respiratory rate, and rectal temperature.



RESULTS

● The **respiratory rate** increased in kids exposed to solar radiation (55.8 ± 1.9 vs. 45.5 ± 1.1 ; $P < 0.01$), especially at 1300h (Figure 1). However the **rectal temperature** did not vary between the two groups.

● The respiratory rate **correlated** with ambient temperature ($r = 0.36$; $P < 0.01$) and rectal temperature ($r = 0.53$; $P < 0.01$) only in kids under shade.

● Daily DMI **was similar** (34.6 ± 2.1 g/kg BW).

● Kids exposed to solar radiation **consumed greater water amount** (5.5 ± 0.9 vs. 2.1 ± 0.2 L/kg DMI; $P < 0.01$).

● Blood protein and glucose contents **did not differ** between groups, but **blood urea** was greater ($P < 0.05$) in group 1 (0.36 ± 0.03 g/L) compared to group 2 (0.27 ± 0.02 g/L).

● Daily body weight gain **tended to be greater** ($P < 0.10$) in kids exposed to solar radiation (55 ± 8 vs. 37 ± 3 g).

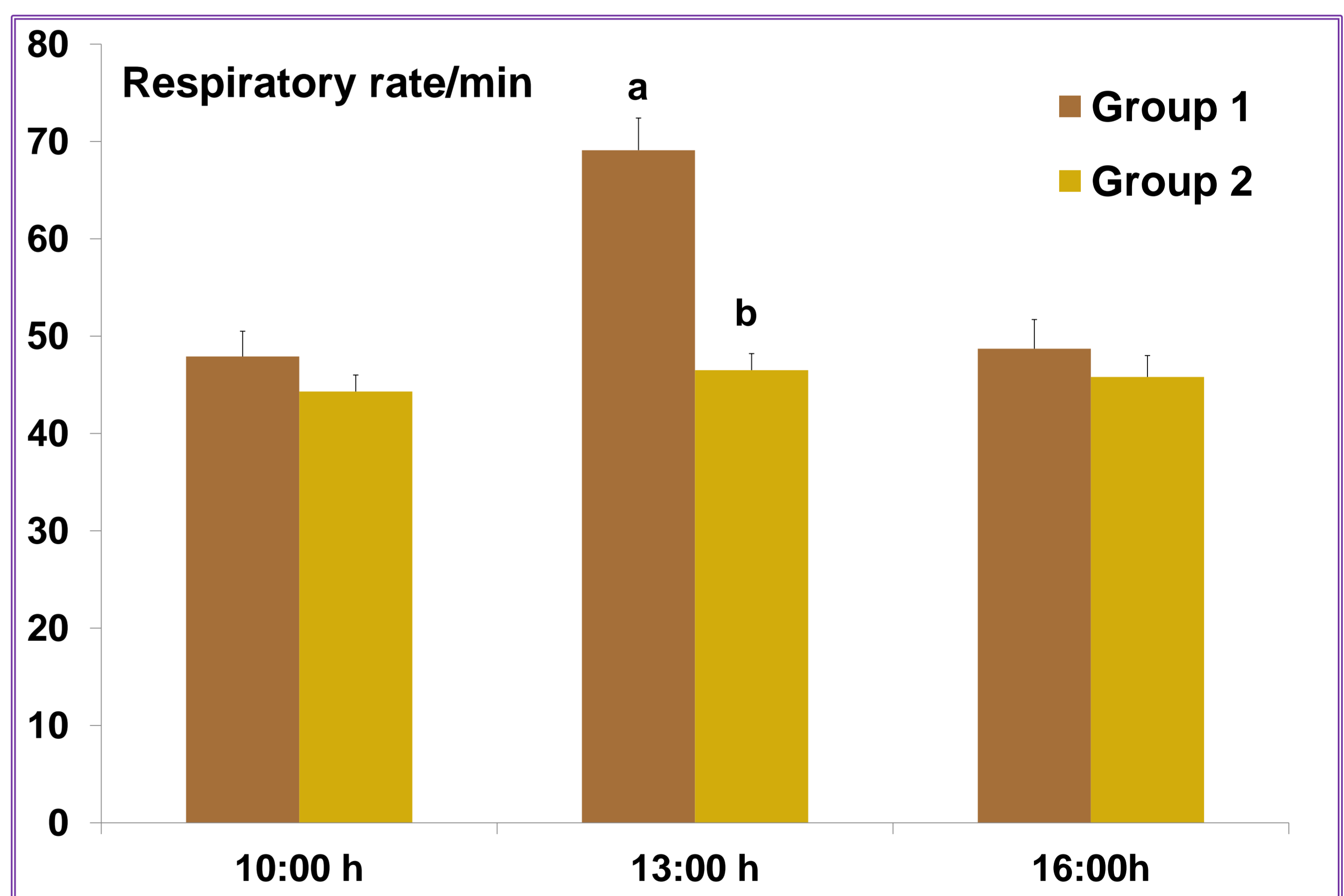


Figure 1. Respiratory rate in Tunisian kids exposed to solar radiation (Group 1) or maintained under shade (Group 2).

CONCLUSIONS

● Values of rectal temperature and respiratory rate observed in the Tunisian local goats under heat stress are lower than those reported in goat breeds of temperate zones.

● Goats adapt to solar radiation by increasing respiratory rate, water consumption, and blood urea without changes in the DMI.