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EFFECT OF SHEARING ON RABBIT BUCKS PERFORMANCES IN HOT AMBIENT CONDITIONS *

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ABSTRACT

Twenty N.Z.W. bucks, homogeneous for age (27 weeks) and live weight (3.3 kg) were divided into 2 randomized groups, one of which was sheared with the exception of head and paws. Both groups were put in a climatic cell and exposed to a variable ambient temperature: 5 hours at 30°C and 19 hours at 22°C (R.H. 75%) for 10 weeks.

Live weight and feed consumption were weekly recorded. Sperm was evaluated every 15 days for colour, volume, concentration, motility and pH.

Shearing had no effect on live weight, but it reduced the negative heat effect on feed intake (1.08 vs 0.86 kg per head per week; $P<0.01$). All the parameters for semen quality remained into the range of normality and, as a consequence, no effect of shearing could be measured.

INTRODUCTION

In a previous experiment, shearing N.Z.W. rabbits has been demonstrated as an efficient method of reducing heat stress for a period of at least 2 days (Finzi et al., 1991). Also in Angora rabbits hair plucking or shearing produced a heat loss for at least one week (Schlolaut, 1987; Vermorel et al., 1988) and this is considered a negative effect since it is referred to cold seasons. Long term effects have not yet been determined nor in Angora nor in meat rabbits.

Rabbit performances are strongly affected by an elevated ambient temperature. Among other parameters, libido and qualitative and quantitative traits of sperm are lower in hot periods (Rathore, 1970; Yan et al., 1975; Waites, 1976; Castelló, 1980; El-Sherry et al., 1980; Matheron and Martial, 1981; Bagliacca et al., 1987; Morera et al., 1990; Kuzminsky et al., 1990).

To evaluate possible positive effects of shearing on rabbits bred in hot ambients for a

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long time, a research has been carried out for a period of 10 weeks, taking into account sperm quality parameters. Also live weight and feed intake were considered.

MATERIALS AND METHODS

Two homogeneous groups, each of 10 animals, were formed utilizing 27 weeks old bucks, taking into account body weight (Kg 3.32 ± 0.3), respiratory rate (165 ± 20 breaths/min) and body temperature (39.1 ± 0.4 °C). One group was then sheared and both groups were set in a climatic cell where a daily variable ambient temperature was programmed (5 hours to 30°C ± 1°C and 19 hours to 22°C ± 1°C; R.H. 75% ± 10%). This daily cycle of ambient temperature was set to simulate real condition in subtropical areas (Finzi et al., 1992a) considering that the long term planned for the experiment suggested not to work in conditions of constant heat stress.

The experiment was planned to endure 10 weeks, to permit the evaluation of the effects on sperm quality, taking in to account that spermatogenesis lasts about 6 weeks (Campo et al., 1980; Boussit, 1989; McNitt, 1991).

Shearing was made with an automatic shaver for small animals veterinary surgery. Shearing operation left hair about 2 mm long; paws and head were not sheared.

Lighting was programmed in the climatic cell to simulate summer conditions (16 hours light; 8 hours dark).

Live weight and feed consumption were weekly recorded. Sperm was collected three times a week with an artificial vagina. Every 15 days two consecutive sperm collections were separately evaluated for colour (Ivory, creamy or watery white, yellowish and pink), volume (total of two consecutive collections), concentration, vitality (point scale from 1 to 4) and pH for a total of 1200 evaluations. Concentration was the pondered mean of two samples for each ejaculate. Each sample, put in a capillary tube, was centrifuged (10,000 rotations/min for 10 minutes) obtaining a spermatic volume to be confronted with a graded scale. This was previously set by comparing spermatic volume with concentration directly determined through a counting in Büerker slide (Bagliacca et al., 1991). Testicles weight was determined at slaughter at the end of the trial.

RESULTS AND DISCUSSION

In the experimental period both groups presented a similar trend for live weight (fig. 1). The small difference (about 50-60 g) was not significant and tended to disappear.

Feed intake (fig. 2) of sheared animals was higher in comparison to controls (Kg 1.08 vs 0.86 per head per week) and the difference was statistically significant ($P<0.01$) during the first 6 weeks after treatment. The values tended to coincide after this period. The

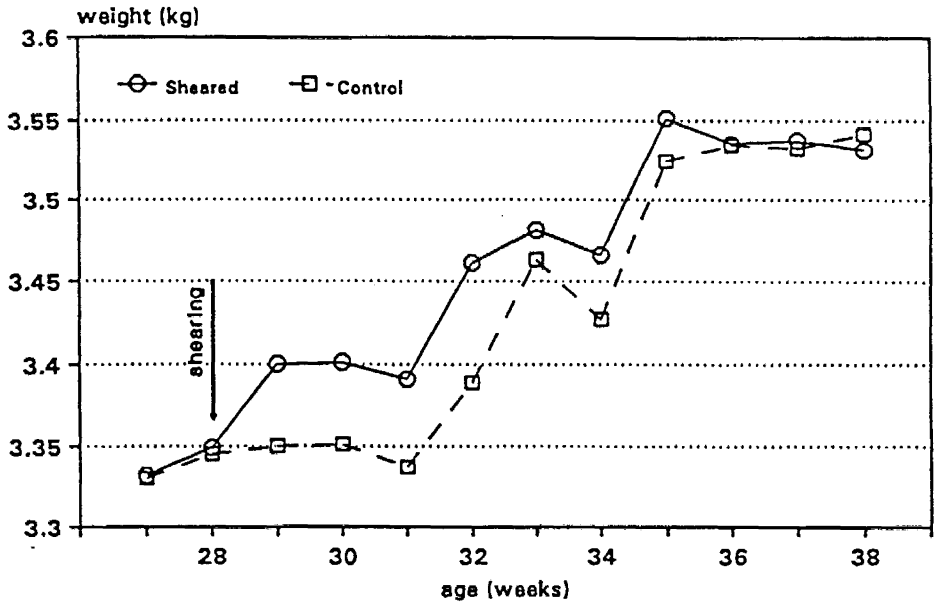

Fig.1. Live weight of bucks in the experimental period.

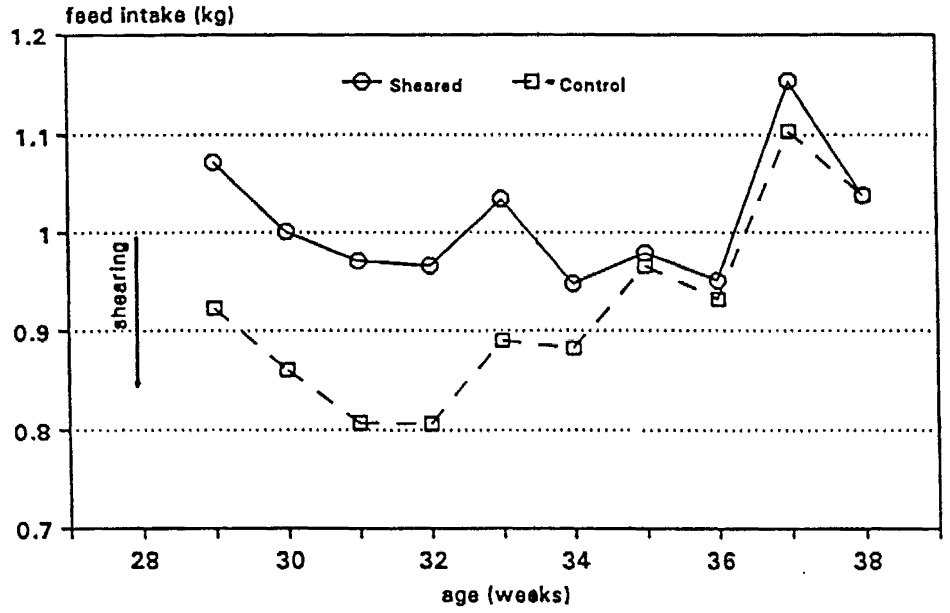

Fig.2. Feed intake per head per week.

negative effect of high ambient temperatures on feed intake is well known (Bagliacca et al., 1987; Simplicio et al., 1988; Bonsembiante et al., 1989; Trammel et al., 1989; Maertens and De Groote, 1990 to quote the most recent literature). The experimental result indicates that shearing induces a higher feed intake in the experimental conditions. This can be due to better physiological condition in the heat-stressing hours or to a need to compensate heat losses produced by shearing during the cooler hours (Schlolaut et al., 1987; Vermorel, et al., 1988).

The second hypotesis is supported by lacking differences in live weight. When bucks were kept at constant high or low ambient temperature differences in live weight were significant (Bagliacca et al., 1987).

Tab.1. Sperm characteristics during the experiment (2 consecutive collections together).

		Pre Treatment		First 6 weeks		After 6 weeks	
		Shea.	Contr.	Shea.	Contr.	Shea.	Contr.
Color(%) (ivory + creamy white)		80	70	80	90	90	80
Spermatozoa/ml	$\bar{X}$	250.4	209.0	206.1	238.0	215.5	215.2
($N \times 10^6$)	S.D.	71.9	66.2	62.8	92.7	65.9	59.9
Volume (ml)	$\bar{X}$	1.3	1.3	1.6	1.3	1.2	1.1
	S.D.	0.4	0.3	0.8	0.4	0.6	0.4
Sperm./Ejaculate	$\bar{X}$	318.0	247.4	288.7	286.3	242.8	223.5
($N \times 10^6$)	S.D.	123.2	68.4	107.5	111.0	99.8	51.1
Motility (%)	$\bar{X}$	73.8	71.3	70.8	73.4	77.6	75.7
	S.D.	25.9	15.8	20.6	19.2	14.8	14.1
pH	$\bar{X}$	7.4	7.3	7.6	7.7	7.7	7.7
	S.D.	0.1	0.3	0.3	0.2	0.2	0.2

In table 1 it can be seen that the parameters for sperm quality remain in the range of normality (Campo et al., 1980; Boussit, 1989) in both treatments . The differences observed were very small and not significant. For this reason the recordings relative to first and second sperm collection are not reported, and the table refers only to cumulative data. Also the weight of testicles at the end of the trial showed a small and not significant difference (11.64 ± 1.87 vs 11.12 ± 1.38).

In previous trials data indicated that, when animals are heat-stressed, improving ambient conditions can modify reproductive performances and bucks show a better libido and a higher sperm volume (Morera et al., 1989; Kuzminsky, et al., 1990). Present experimental results indicate that, when the period of high temperature is limited to 5 hours a day, any negative effect can be measured on sperm quality, not even after 6 weeks. As a consequence a possible relieving effect produced by shearing (Finzi et al., 1992b), can't be measured at the level of these parameters.

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