

SEMEN CHARACTERISTICS AND HORMONE CONCENTRATIONS IN THE RAM AS AFFECTED BY
BREED, SEASON AND PHOTOPERIOD

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Relatively little information has been accumulated on the effects of season and/or photoperiod on testicular and semen characteristics in the ram. Scrotal circumference has been shown to be highest in October (Mickelsen, Paisley and Dahmen 1981a), but this same group of investigators was unable to demonstrate differences in conception rates as related to scrotal circumference or sperm morphology (Mickelsen, Paisley and Dahmen 1981b). The present experiment was designed to evaluate the effects of different photoperiods on semen and hormone characteristics in three breeds of ram in anoestrus and early breeding season.

Twenty seven adult rams (9 Suffolk, 9 Texel and 9 Dorset Horn) were raised under natural photoperiod and were trained to serve into an artificial vagina. On April 1 they were abruptly exposed to 3 different photoperiods as follows: (i) 8 hours light and 16 hours darkness (8L:16D); (ii) 16 hours light and 8 hours darkness (16L:8D); (iii) natural photoperiod. All rams were kept at pasture daily between 0930h and 1600h except when required indoors for experimental work. Rams on artificial photoperiod had appropriate supplemental lighting in an environmental chamber. Semen collection was attempted from each ram on alternate weeks during the experiment which lasted for 6 months. Semen was evaluated for volume, density, motility and abnormalities. Testicular length and circumference were recorded at 2-week intervals and libido was recorded at 4-week intervals. Three blood samples were collected from each ram at 30 min intervals on a weekly basis and the plasma was stored at -20°C until assayed for testosterone and prolactin.

Photoperiod had no significant effect on semen volume, motility and percentage dead or abnormal cells. Breed of ram had a significant effect on semen motility ($P < 0.05$) with Dorset Horn rams producing semen with the highest motility. Month appeared to have the greatest influence on the semen characteristics examined. Volume and motility scores both increased as the breeding season approached ($P < 0.05$), while the percentage of abnormal cells decreased ($P < 0.01$). Breed or photoperiod did not significantly affect scrotal measurements although animals exposed to 8L:16D tended to have the highest measurements. Month affected testicular measurements which generally increased from April to September. Suffolk rams tended to have higher testosterone concentrations, and this breed also completed the highest number of mounts within an allocated test time ($P < 0.05$). Dorset Horn rams tended to reach a peak in testosterone concentrations in June/July whereas Suffolks and Texels reached a similar peak in August. Prolactin concentrations decreased from a maximum at the start and rams on natural photoperiod tended to have highest levels.

These results show that month can have a bigger influence on semen characteristics than imposed artificial photoperiods in rams which have been exposed to increasing natural daylength for some months.

MICKELSON, W.D., PAISLEY, L.G. and DAHMEN, J.F. (1981a). Theriogenology **16**:45.

MICKELSEN, W.D., PAISLEY, L.G. and DAHMEN, J.F. (1981b). Theriogenology **16**:53.

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