

Journal of Andrology, Vol 5, Issue 2 64-69, Copyright © 1984 by The American Society of Andrology

JOURNAL ARTICLE

Periodic exposure to a brief light signal stimulates neuroendocrine-gonadal activity in golden hamsters

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The photoperiodic effects of a periodic light pulse on neuroendocrine-gonadal activity in the male golden hamster was examined using a night interruption paradigm. Adult male hamsters that had been housed 3 to 5 per cage on LD 14:10 were placed either in individual cages, each equipped with a running wheel, or maintained in communal housing conditions, without access to a running wheel. Animals were then transferred to either LD 6:18 or to a LD 6:18 light cycle with a periodic 10-second night interruption (8 hours after lights off) occurring once every two, four, or seven days. As expected, exposure to LD 6:18 for 11 weeks induced complete regression of the testes and seminal vesicles, accompanied by low serum levels of LH and FSH, in both individually and communally-housed animals. However, in individually-housed animals receiving a 10-second night interruption every other day on LD 6:18, paired testis and seminal vesicle weights, as well as serum gonadotropin levels, were maintained at values comparable to those normally observed in hamsters exposed to photostimulatory long days. Furthermore, the presentation of a periodic 10-second night interruption once every four or seven days to individually-housed animals with access to a running wheel was sufficient to partially or totally block the inhibitory effects of short days on neuroendocrine-gonadal activity. Communally-housed hamsters receiving a 10-second light pulse once every two, four, or seven days also exhibited paired testis and seminal vesicle weights, as well as serum gonadotropin levels, that were consistently higher than the values obtained for animals exposed only to LD 6:18. (ABSTRACT TRUNCATED AT 250 WORDS)

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