

THE EFFECT OF DAILY LIGHTING PROGRAM ON THE PERFORMANCE OF GROWING RABBITS

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ABSTRACT

The aim of the present experiment was to compare the performance of growing rabbits between 5 and 10 weeks of age under 16L:8D or 8L:4D:8L:4D lighting program (light:dark) conditions. Pannon White rabbits weaned at the age of 5 weeks were housed in two identical rooms, the only difference was the photoperiod. A commercial pelleted diet was fed *ad libitum*. Except a one-week period, the performance of the two groups was identical. The daily body weight gain was 41.5 and 41.9 g, the body weight at the age of 10 weeks was 2353 and 2353 g, the daily feed intake was 111 and 112 g, while the mortality was 0.5 and 2.9% in the 16L:8D and in the 8L:4D:8L:4D groups, respectively.

Key words: rabbits, photoperiod, growth, feed intake, mortality.

INTRODUCTION

It has been described for a long time that rabbits are more active in darkness, their feed and water intake is higher than in light periods (PRUD'HON *et al.*, 1975; REYNE *et al.*, 1978a). However, rabbits kept in total darkness in the whole fattening period do not show higher feed intake, since consumption peaks and resting periods show similar periodicity as under conventional lighting conditions (REYNE *et al.*, 1979; JILGE, 1987).

In the present experiment the performance of growing rabbits was investigated under conventional (16L:8D, light and dark) and periodic (8L:4D:8L:4D) lighting conditions.

MATERIAL AND METHODS

The experiment was carried out at the rabbit farm of the University of Kaposvár, on Pannon White rabbits. After weaning at 5 weeks of age, rabbits were housed in two identical rooms. The only difference was the photoperiod applied in the two groups; in the first group 16L:8D (n=210) was set, while in the other the photoperiod was 8L:4D:8L:4D (n=210). The light period within 24 hours was, therefore, identical (16 hours), but the lighting was provided in one or two (8+8 hours) parts. Rabbits were

housed in 375 x 400 mm wire net cages (2 rabbits/cage). Pellet (10.6 MJDE/kg feed, 16.0% crude protein, 16.0% crude fibre) and water from nipple drinkers were provided *ad libitum*.

Body weight and feed intake was measured weekly, the daily body weight gain and the feed conversion was calculated and the mortality was recorded continuously.

Data were evaluated by one-way analysis of variance, by means of the SPSS 10.0 software package. The mortality of the two groups was compared by the χ^2 test.

RESULTS AND DISCUSSION

Experimental data are summarized in Table 1.

The body weight of the two groups was perfectly identical.

In the body weight gain near to significant ($P=0.055$) or significant ($P=0.005$) differences were found between 7th and 8th and between 9th and 10th weeks, respectively. Since by the first occasion the 8L:4D:8L:4D, while thereafter the 16L:8D showed better results, the difference may be random, which is also indicated by the similar body weight gain as calculated for the whole fattening period between 5 and 10 weeks of age.

The feed intake of the two groups not differed significantly under the two lighting programs for the whole period.

The feed conversion was better either in one, or in the other group, in an alternating manner. Though the significant differences between 8th and 9th and between 9th and 10th weeks may be random, since the values calculated for the whole fattening period were equal.

In the mortality the 16L:8D group showed near significantly lower values. As the mortality of the other group was also very low (2.9%), this difference may not be attributed to the treatment.

The equal results of the two groups can be explained in two ways. If the level of feed consumption is high only once within 24 hours (REYNE *et al.*, 1979; JILGE, 1987), then the partitioned lighting does not influence the daily feed intake. However, when the feed intake is higher in the dark period and lower in the light (PRUD'HON *et al.*, 1975; REYNE *et al.*, 1987a.), supposing that the dark period is equal (8 hours) within 24 hours, the feed intake can not be different.

According to the experiment of REYNE *et al.* (1978b) when a 10-hour dark period is increased to 16 hours, this leads to an increase of the mean daily feed intake, from 176 g to 183-186 g. It was proven by the observation of the feed intake within 24 hours that the feed intake after the resting period increased somewhat earlier, as a result of the

Table 1. Effect of photoperiod (16L:8D or 8L:4D:8L:4D) on productive traits of growing rabbits.

Age weeks	Photoperiod		SE	Prob
	16L:8D	8L:4D:8L:4D		
Body weight, g				
n	210	210		
5	942	931	5.5	0.32
6	1189	1179	6.5	0.45
7	1499	1499	7.7	0.97
8	1785	1789	8.6	0.80
9	2088	2081	9.6	0.70
10	2353	2353	10.1	0.99
Weight gain, g/day				
5-6	41.8	41.4	0.32	0.52
6-7	44.8	45.7	0.29	0.14
7-8	40.7	41.8	0.30	0.055
8-9	44.0 ^B	42.0 ^A	0.36	0.005
9-10	38.1	39.3	0.40	0.14
5-10	41.5	41.9	0.23	0.39
Feed intake, g/day				
n	60	60		
5-6	53	53	0.4	0.61
6-7	109	112	1.1	0.17
7-8	117	119	1.1	0.42
8-9	132	134	1.9	0.24
9-10	137	135	1.2	0.41
5-10	111	112	0.7	0.47
Feed conversion, g/g				
5-6	1.33	1.29	0.029	0.47
6-7	2.70	2.57	0.060	0.28
7-8	2.92	3.02	0.047	0.28
8-9	3.01 ^A	3.27 ^B	0.049	0.009
9-10	3.91 ^B	3.59 ^A	0.072	0.027
5-10	2.72	2.72	0.021	0.99
Mortality, %			Chi²	Prob
5-6	0	0		
6-7	0	1.4		
7-8	0.5	1.0		
8-9	0	0.5		
9-10	0	0		
5-10	0.5	2.9	3.62	0.057

16L:8D: conventional (light and dark) lighting conditions

8L:4D:8L:4D: periodic lighting conditions

SE: standard error of mean

longer dark period. Thus, the consumption peaked some hours earlier, than it happened before changing the photoperiod. But in our experiment kits were under a constant dark duration (8 hours or 4+4 hours), so consequently, no difference was observed in feed intake.

For a better explanation of our results it would be worth observing the feeding behaviour under 16L:8D and 8L:4D:8L:4D lighting conditions.

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