

## EXAMINATION OF FEEDER SIZE FOR GROWING RABBITS

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### ABSTRACT

In two experiments the free choice of growing rabbits among cages with different length of feeders and the effect of the length of the feeder on the rabbits' growth were examined. Experiments were carried out on the rabbit farm of the University of Kaposvár using Pannon White rabbits. The temperature of the rabbit house was 16-18°C on average and a 16L:8D lighting period was applied. Rabbits were fed *ad libitum* a commercial diet in pellet and water was available *ad libitum* from nipple drinkers. In the first experiment 24 growing rabbits were reared in cage blocks (1.5 m<sup>2</sup> floor-area, 16 rabbits/m<sup>2</sup>) from 5 to 10 weeks of age (n=144). The blocks consisted of 4 cages of the same size and the rabbits could move freely among the cages through swing doors. The cages only differed in the size of the feeder. In the various cages the lengths of the feeders were 10, 20, 30 or 40 cm, respectively. Using infrared cameras 24 hour video recordings were performed once a week and the number of rabbits in the cages was counted for 30 minutes. Feed consumption was measured weekly using the different sized feeders. The experiment was carried out in 6 repetitions. Although the choice of the cages with different sized feeders was significantly different in all weeks, only a small difference in the choice across the whole experimental period was observed: 22, 25, 26 and 27% of rabbits stayed in cages with 10, 20, 30 and 40 cm length feeders, respectively. The feed consumption also changed according to the length of the feeders: 12.6, 17.9, 24.9 and 44.6% from the feeders with a length of 10, 20, 30 and 40 cm respectively. In the second experiment 13 growing rabbits were reared in four pens (0.96 m<sup>2</sup> floor-area) from 5 to 10 weeks of age (n=156). Every pen was equipped with two nipple drinkers. The pens only differed in the size of the feeder. The lengths of the feeders were 10, 20, 30 or 40 cm in the pens. The experiment was carried out in 3 repetitions. The body weight of the rabbits and the feed consumption from the different sized feeders were measured weekly. Using infrared cameras 24 hour video recordings were performed once a week and the number of rabbits found in front of the feeders was counted for 30 minutes. The body weight of rabbits was not affected by the length of the feeders (at 10 weeks of age: 10 cm: 2298 g; 20 cm: 2329 g; 30 cm: 2320 g; 40 cm: 2363 g, P=0.425). There was no significant difference in feed intake (P=0.968) or feed conversion in pens with different sized feeders. It can be concluded that the feeders used in rabbit breeding have of an appropriate size from the viewpoint of animal welfare and rabbits' growth.

**Key words:** Growing rabbits, Feeder size, Preference, Production.

### INTRODUCTION

From the animal welfare viewpoint the possibility of an appropriate feed intake (per time unit) is of critical importance. In spite of this only few experiments have been carried out in connection with the size, form or placing of the feeder. Remois *et al.* (1999) reared seven rabbits in cages with 45 or 22.5 cm long feeders. Tudela and Lebas (2006) reared 6 and 8 rabbits in cages and the feeding places were 1, 2 or 4. In both experiments the growing performance of rabbits was not influenced by the length of feeder. Feeders are designed and produced by the cage manufacturers according to their own experiments or professional experiences.

Because recently rearing rabbits in large groups has been recommended, we examined the effect of the feeder length on the free choice and growing performance of rabbits housed at a density of 13 rabbits/cage.

## MATERIALS AND METHODS

Experiments were carried out on the rabbit farm of the University of Kaposvár using Pannon White rabbits. The temperature of the rabbit house was 16-18°C on average and a 16L:8D lighting period was applied. Rabbits were fed *ad libitum* a commercial pellet from weaning till the age of 8 weeks (10.3 MJ DE/kg, 14.5% crude protein, 17.5% crude fibre, medicated) and between the ages of 8 and 10 weeks (10.6 MJ DE/kg, 16.0% crude protein, 16.0% crude fibre). Water was available *ad libitum* from nipple drinkers.

### Experiment 1

24 growing rabbits were reared in cage blocks (1.5 m<sup>2</sup> floor-area, 16 rabbits/m<sup>2</sup>) from 5 to 10 weeks of age. The blocks consisted of 4 cages of the same size and the rabbits could move freely among the cages through swing doors. Every cage was equipped with two nipple drinkers. The cages only differed in feeder size. The lengths of the feeders in the cages were 10, 20, 30 or 40 cm, respectively. Feed consumption was measured weekly using feeders of different sizes. Through infrared cameras 24 hour video recordings were performed once a week and the number of rabbits in each cage was counted for 30 minutes. The experiment was carried out in 6 repetitions.

The data were analysed by One Way ANOVA using the SPSS 11.5 software package.

### Experiment 2

13 growing rabbits were reared in four pens (0.96 m<sup>2</sup> floor-area) from 5 to 10 weeks of age (n=156). Every pen was equipped with two nipple drinkers. The pens only differed in feeder size. The lengths of the feeders in the pens were 10, 20, 30 or 40 cm. The experiment was carried out in 3 repetitions. The body weight of the rabbits and the feed consumption from the different sized feeders were measured weekly. Using infrared cameras 24 hour video recordings were performed once a week and the number of rabbits standing in front of the feeders was counted for 30 minutes.

The data were analysed by One Way ANOVA using the SPSS 11.5 software package.

## RESULTS AND DISCUSSION

### Experiment 1

Table 1 shows the free choice of rabbits among the cages equipped with different sized feeders. Although the choice of the cages with different sized feeders was significantly different across all weeks, only a small difference in the choice during the whole experimental period was observed: 22, 25, 26 and 27% of rabbits stayed in cages with 10, 20, 30 and 40 cm length feeders, respectively. At the age of 5-6 weeks most of the rabbits (32.2%) stayed in the cage equipped with a 20 cm long feeder. It may be independent of the feeder size. Matics *et al.* (2004) showed that weaned rabbits like moving to one of the cages and huddling together with a higher stocking density. From the age of 6 weeks (between 6-7, 8-9 and 9-10 weeks of age) most rabbits stayed in the cage with the longest feeder but the preference of cage with 10 cm-long feeder was also high (near to 25%).

**Table 1:** Choice rate of rabbits among cages with different sized feeders (%)

Age (weeks)	Length of feeder (cm)				SE	Prob
	10	20	30	40		
5-6	20.2 a	32.2 c	26.3 b	21.3 a	0.45	<0.001
6-7	21.2 a	22.5 a	23.2 a	33.2 b	0.36	<0.001
7-8	22.2 a	23.0 a	29.4 c	25.5 b	0.29	<0.001
8-9	25.0 b	22.7 a	25.3 bc	27.0 c	0.26	<0.001
9-10	21.4 a	24.6 b	25.9 b	28.1 c	0.23	<0.001

a, b, c: P&lt;0.001

The rabbits could be located in the various cages with different frequencies and proportionally consumed more feed from the longer feeders (Table 2). Results show that rabbits visited the longer feeders only during feeding time and moved to another cage afterwards to avoid a higher stocking density.

**Table 2:** Feed consumption of rabbits in cages with different sized feeders (%)

Age (weeks)	Length of feeder (cm)			
	10	20	30	40
5-6	12.6	22.6	29.4	35.4
6-7	13.7	17.8	20.6	47.9
7-8	15.7	14.1	21.5	48.7
8-9	12.7	19.0	24.9	43.4
9-10	8.7	16.7	28.0	46.5
5-10	12.6	17.9	24.9	44.6

## Experiment 2

Table 3 shows the body weight of rabbits reared in pens equipped with different sized feeders. The body weight of growing rabbits was not influenced by the feeders' length. There was no significant difference in the feed intake (P=0.968) or feed conversion in pens with different sized feeders. It did not affect the growth of rabbits if 13 growing rabbits were allowed to eat from a 10 cm long feeder.

**Table 3:** The body weight of rabbits reared in pens with different sized feeders (g)

Age (weeks)	Length of feeder (cm)			
	10	20	30	40
5	1090	1090	1090	1090
6	1339	1341	1333	1358
7	1583	1592	1608	1630
8	1890	1893	1894	1916
9	2164	2159	2152	2170
10	2298	2329	2320	2363

The number of rabbits that stood in front of the feeders was not influenced by the length of the feeders either (Table 4). When 13 rabbits were reared in groups, the waiting time in front of a 10 cm or 40 cm long was not significantly different. According to the observation of Prud'hon *et al.* (1972) rabbits eat 30-40 times a day and their eating activity has the same frequency during the light and the dark period. In this manner, even 13 growing rabbits had enough time to eat without considerable waiting time.

**Table 4:** Number of rabbits that stood in front of the different sized feeders

Age (weeks)	Length of feeder (cm)				SE	Prob
	10	20	30	40		
5-6	1.24	1.19	1.04	1.22	0.04	0.299
6-7	1.32	1.36	1.42	1.30	0.04	0.758
7-8	1.24	1.19	1.26	1.24	0.04	0.941
8-9	1.03	1.01	1.08	0.97	0.04	0.751
9-10	0.97	0.95	1.06	1.15	0.04	0.175

The number of rabbits that stood in front of the feeder at the same time decreased with advancing age (6-7 weeks: 1.35, 9-10 weeks: 1.03). Although rabbits eat more feed per day with increasing age, older

rabbits can eat a higher amount of feed during the same period of time because “feed consumption per minute” increases (Szendrő *et al.*, 1988).

## CONCLUSIONS

It can be concluded that the type of feeders currently being used in rabbit breeding have of an appropriate size, because 13 growing rabbits can consume enough feed from a 10 cm long feeder.

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