

## EXAMINATION OF FREE CHOICE OF GROWING RABBITS AMONG DIFFERENT FLOOR-TYPES

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### ABSTRACT

Location preference of growing rabbits was evaluated depending on the different floor types (plastic-mesh, wire-mesh and deep-litter). The experiment was conducted at the experimental rabbit farm of Kaposvár University using growing rabbits of maternal line of the Pannon Rabbit Breeding Programme (n=129). At weaning (at the age of 5 wk), the rabbits were placed to one of the 3 pens each with a basic area of 3.8m<sup>2</sup> (1.9x2.0m) (43 rabbits/pen, 12 rabbits/ m<sup>2</sup>). The floor of the pens was partly wire-mesh (1/3), plastic-mesh (1/3) and deep-litter (1/3). With infrared cameras, 24h video recording was made once a week, between 5 and 11 weeks of age. The number of rabbits in each location in the pens was recorded every 30 minutes. The 24h observations were divided into four 6-h periods starting at 5:00 h. The average temperature in the room was 10.5°C. The frequencies at the different locations were compared by means of Chi-square test, testing the difference between observed and expected (33.3%) frequencies. The rabbits showed the highest preference for plastic-mesh (P<0.001), at every age they spent more time there (70 and 52%, at the ages of 5.5 and 10.5 wk, respectively) than the expected value (33.3%) in case of random choice of floor type. Between the ages of 5.5 and 9.5 weeks the preference of the wire-mesh floor was significantly lower than 33.3% (20-27%; P<0.001), but at the age of 10.5 weeks it was not significantly different from value of 33.3% (P>0.1). Deep-litter was the least frequently chosen floor type at all ages (8 and 14%, at the ages of 5.5 and 10.5 wk, respectively; P<0.001). Similar tendencies were observed when the location preference was evaluated separately for the different day parts. Based on the results it can be concluded that at the temperature of 10°C the growing rabbits showed the highest and lowest preferences for the plastic-mesh and for deep-litter, respectively.

**Key words:** Growing rabbits, preferences, floor type

### INTRODUCTION

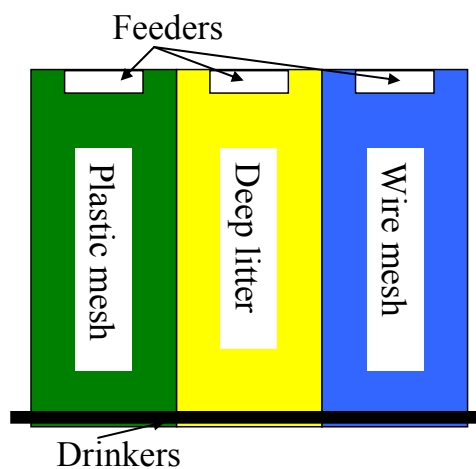
The welfare of rabbits is a factor of increasing importance in the development of housing technologies. From the aspect of animal welfare, the floor is one of the most important technological elements, as the animals spend most of their time contacting the floor (locomotory behaviour, resting behaviour). Deep-litter is considered as an optimal floor type for rabbits by the consumers and by some researchers. However, opposite findings were reported by Morrise *et al.* (1999) and Orova *et al.* (2005). Bessei *et al.* (2001) concluded that in a higher temperature (above 15°C) the rabbits preferred plastic-mesh but at a lower temperature deep-litter was chosen. According to Princz *et al.* (2008), the rabbits preferred the plastic-mesh compared to wire-mesh floor, both in the active and in resting periods. Similar results were published by Matics *et al.* (2003). So far no studies were made where three different floor types were evaluated simultaneously.

In this experiment, the location preferences of growing rabbits were examined depending on the different floor types (plastic-mesh, wire-mesh and deep-litter).

## MATERIALS AND METHODS

### Animals and experimental design

The experiment was conducted at the experimental rabbit farm of Kaposvár University using growing rabbits of the maternal line of the Pannon Rabbit Breeding Programme ( $n=129$ ). At weaning (at the age of 5 wk) the rabbits were placed to one of the 3 pens, each with a basic area of  $3.8\text{m}^2$  ( $1.9 \times 2.0\text{m}$ ) (43 rabbits/pen, 12 rabbits/ $\text{m}^2$ ). Daily lighting period was 16h (6:00-22:00), and the average temperature in the room was  $10.5^\circ\text{C}$  with a small fluctuation (10.1, 11.9, 10.6, 9.7, 10.1 and  $10.9^\circ\text{C}$  at weeks 5, 6, 7, 8, 9 and 10, respectively). The rabbits could consume a commercial pellet *ad libitum* (5-9 weeks of age: DE=10.3 MJ/kg; CP=16.1%; EE=2.8%; CF=16.9 % and medication; 9-11 weeks of age: DE=11.0 MJ/kg; CP=16.1%; EE=4.4%; CF=16.0%). Water was available *ad libitum* from nipple drinkers. The floor of the pens was partly wire-mesh (1/3), plastic-mesh (1/3) and deep-litter (1/3) (Figure 1). Every part of the pens was equipped with feeder and nipple drinkers. Deep litter was replaced weekly and fresh straw was placed to the deep-litter daily.



**Figure 1:** Experimental design

Infrared cameras were fixed above the pens. A 24h video recording was made once a week, between 5 and 11 weeks of age. On the days of recording nobody entered the room. The number of rabbits in each location in the pens was recorded every 30 minutes. The 24h observations were divided into four 6-h periods, starting at 5:00 h. From the number of rabbits located at the three parts, percentages were calculated. The percentages were averaged for the part of the day. Beside location, the feed intake of the rabbits was also recorded. The feed intake from feeder in different parts of the pen was given proportionally to that of the whole consumption in the pen (100%).

### Statistical analysis

The frequencies at the different locations were compared by means of Chi-square test, testing the difference between observed and expected (33.3%) frequencies. Within the same floor type frequencies at the different age categories and day parts were also evaluated by means of Chi-square test. All statistical analyses were conducted using the SPSS 10.0 software package.

## RESULTS AND DISCUSSION

Location preference of the growing rabbits depending on the age is presented in Table 1.

The rabbits showed the highest preference for plastic-mesh floor, and at every age category they spent more time there ( $P < 0.001$ ) than the expected value of 33.3% in case of random choice of floor type. In the order of preference, the second floor type was the wire-mesh. Between the ages of 5.5 and 9.5 weeks, the preference of the wire-mesh floor was significantly lower than 33.3% (20-27%;  $P < 0.001$ ), but at the age of 10.5 weeks it was not significantly different to this value ( $P > 0.1$ ). Deep-litter was the least frequently chosen floor type (8-18%,  $P < 0.001$ ). Floor choice showed a tendency of equalization. At the week after weaning the difference between the plastic-mesh and wire-mesh, and between the wire-mesh and deep-litter was 46% and 15%, and that changed to 19% and 19% at the end of the experiment, respectively. Similarly to our results, at the temperature of 16-18°C, Matics *et al.* (2003) and Princz *et al.* (2008) reported the higher preference of growing rabbits for plastic-mesh to wire-mesh floor. Results of the choice between wire-mesh and deep-litter were in accordance with the results of the literature (Morrisse *et al.*, 1999; Orova *et al.*, 2005) contrary to the low temperature. Bessei *et al.* (2001) concluded that in a higher temperature (above 15°C) the rabbits preferred plastic-mesh, but at a lower temperature deep-litter was chosen. In this experiment the temperature was below 15°C at all ages, but the deep-litter choice was substantially lower than that of the two other floor types. Deep-litter preference can be affected by its condition (soiled or wet by urine). This possible effect was minimized by changing the deep-litter weekly and by placing fresh straw to deep-litter daily. Similarly to our observations, Matics *et al.* (2003) and Princz *et al.* (2008) reported that with the advancing age the rabbits choose more frequently the less preferred floor types, and spend less time on the floor type that was previously most preferred. This finding can be explained with the rabbits' growth due to increasing space requirement more and more rabbit forced to choose the less preferred floor type.

**Table 1:** Effect of floor type on the preference of growing rabbit (%)

Age, weeks	Floor type		
	Plastic mesh	Deep litter	Wire mesh
5.5	69.7*** <sup>D</sup>	7.6*** <sup>A</sup>	22.8*** <sup>B</sup>
6.5	72.6*** <sup>E</sup>	7.7*** <sup>A</sup>	19.8*** <sup>A</sup>
7.5	66.1*** <sup>C</sup>	9.9*** <sup>B</sup>	24.0*** <sup>B</sup>
8.5	59.8*** <sup>B</sup>	17.7*** <sup>E</sup>	22.5*** <sup>B</sup>
9.5	60.6*** <sup>B</sup>	12.6*** <sup>C</sup>	26.7*** <sup>C</sup>
10.5	52.3*** <sup>A</sup>	14.4*** <sup>D</sup>	33.3 <sup>D</sup>

PM= plastic-mesh, DL= deep-litter, WM= wire-mesh;

\*\*\*differences are significant in  $P < 0.001$  level compared to 33.3%;

A, B, C, D, E : indicates significant differences within a column ( $P < 0.05$ )

The preference order of the floor types was not affected by the parts of the day. The plastic-mesh and the deep-litter were the most and least preferred floor types at every day part (Table 2). During the active period (23:00-5:00) more rabbits could be located on the plastic-mesh floor (by 8%;  $P < 0.001$ ), and less rabbits chose the wire mesh floor (by 7%;  $P < 0.001$ ) than during the resting period (11:00-17:00). Princz *et al.* (2008) observed similar tendencies.

Feed consumption showed similar tendencies to that of location preference during the first 3 weeks but between the ages of 8.5 and 10.5 weeks the feed consumed at the plastic-mesh and wire-mesh floors was not different (Figure 2). Similarly to the floor preference, the rabbits consumed the least amount of feed at deep-litter. However, as it was found for floor choice, a tendency of equalization was also found for feed consumption.

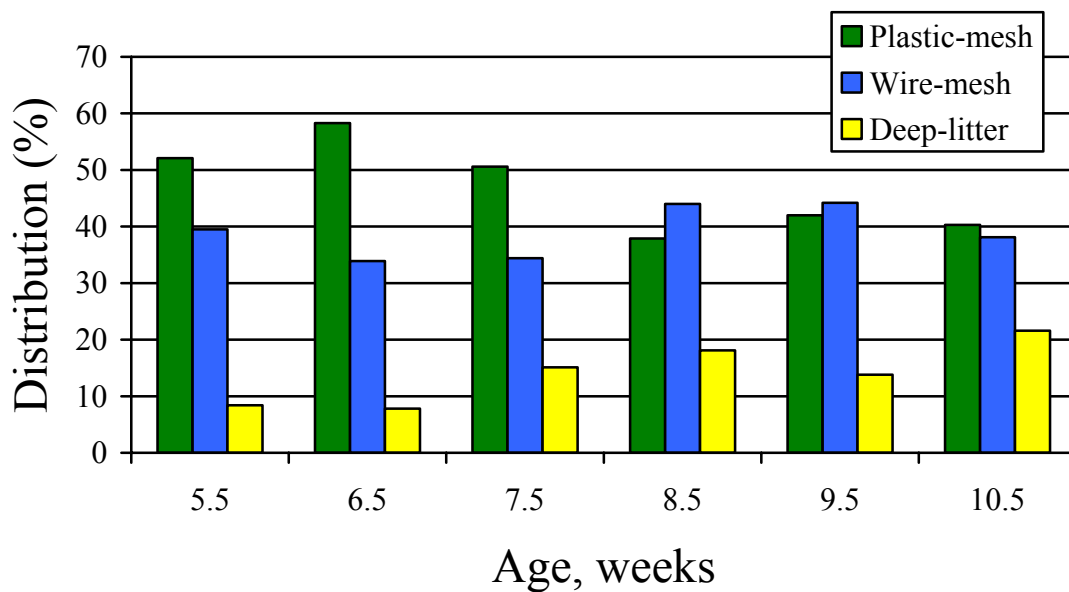
**Table 2:** Free choice of growing rabbits (%) among floor types depending on the part of the day

Parts of the day (hours)	Floor type		
	Plastic mesh	Deep litter	Wire mesh
23:00 - 05:00	71.8*** <sup>C</sup>	8.8*** <sup>A</sup>	19.4*** <sup>A</sup>
05:00 - 11:00	59.2*** <sup>A</sup>	14.4*** <sup>D</sup>	26.3*** <sup>B</sup>
11:00 - 17:00	64.1*** <sup>B</sup>	10.0*** <sup>B</sup>	26.0*** <sup>B</sup>
17:00 - 23:00	58.9*** <sup>A</sup>	13.4*** <sup>C</sup>	27.7*** <sup>C</sup>
<b>Total</b>	<b>63.5***</b>	<b>11.6***</b>	<b>24.8***</b>

PM= plastic-mesh, DL= deep-litter, WM= wire-mesh;

\*\*\*differences are significant in P<0.001 level compared to 33.3%;

A, B, C, D indicates significant differences within a column (P<0.05)

**Figure 2:** Feed intake rate of growing rabbits on different floor types (total intake = 100%)

## CONCLUSIONS

Based on the results at the temperature of 10°C the rabbits show the highest and lowest preference to plastic-mesh and deep-litter floors, respectively (independently from age and day part). Location preference could also be analyzed at a higher temperature.

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