PREFERENCE OF RABBIT DOES AMONG DIFFERENT NEST MATERIALS

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ABSTRACT

The aim of the experiments was to examine which nest materials were preferred by multiparous does to build the nest. The experiments were conducted at the Kaposvár University. In the experiment 1 (n=27 does) and 2 (n=20 does) three and two racks were installed with hay, straw or fine fibre material /Lignocel®/, and with hay or straw in a pen (1 x 0.91 m) with a nest box, respectively. The experiments lasted from the 27th day of pregnancy till the day of parturition. 24-h video recordings were taken. Videos of rabbit does were evaluated during the whole time of the experiment (5 does/exp.). The occasions of carrying the nest materials from the racks were registered. Experiment 1: The number of nest carrying occasions was significantly higher only on the day of parturition in the case of all nest materials and differences were recorded on the nest material carrying occasions between the nest materials on every experimental day except on the day of parturition. The number of nest carrying occasions/hour from Lignocel® rack was higher than in the case of hay or straw on the -4th, -3rd and -1st day. No straw and very little hay was carried on the -3rd and -2nd day. Every nest contained Lignocel®. 88.9% of does kindled in pure Lignocel®, 7.4% mixed with hay and 3.7% mixed with straw. Experiment 2 (n=20): The materials and methods were similar to the experiment 1, but only hay and straw materials were offered. On every day the nest material carrying occasions were significantly more frequent in the case of straw material. The number of nest material carrying occasions was the highest on the day of parturition. More does purely used the straw (65%) than hay (20%) in the completed nests. In 15% of cases, rabbit does collected nest material from the other rack as well. 80 % of the nests contained straw, 35% contained hay.

Key words: Rabbit does, nest material, preference, rack, parturition.

INTRODUCTION

Hudson *et al*. (1996) observed that wild rabbit does select among available nest materials, preferring dry grass rather than green one, long grass rather than short one, soft rather than hard. Straw and hay are more similar to the materials they use in nature conditions (Hudson *et al*., 2000).

Nest building behaviour is under hormonal control: (Farooq *et al*., 1963; González-Mariscal *et al*., 1994; McNitt and Negatu, 2002) digging the hole, carrying the nest material, pulling and carrying hair from the body.

Racks could function either as a nest material holder or as an environmental enrichment. The fiber rich nest materials which could place in the hay racks: hay (Lidfors, 1997; Berthelsen and Hansen, 1999) and straw (Maertens and Van Oeckel, 2001) can satisfy the needs of chewing of rabbits.

In commercial rabbit farms the most commonly used nest materials are wood shavings, hay, straw, wool and cotton waste or even saw dust (Blumetto *et al*., 2010).
The aim of the experiment was to examine which nest materials (hay, straw or Lignocel®) are preferred by the does to carry to the nest box from the racks and build the nest.

MATERIALS AND METHODS

The experiments were conducted at Kaposvár University on multiparous Pannon White rabbit does between the third and fifth parturition. The temperature was 15-18 ºC, and 16-hour daily lighting was applied. The rabbit does consumed commercial pellet *ad libitum* and water was available from nipple drinkers. In each 1.0 x 0.91 m pen one rabbit doe and one empty nest box (0.37 x 0.23 m and 0.31 m height) and three 0.30 x 0.40 x 0.125 m racks were placed with 400 g nest material: hay, straw or wooden thin long fibre material (Lignocel®, J.Rettenmaier&Söhne GmbH) in random order in the experiment 1 (n=27 does). In the case of the experiment 2 (n=20 does) two racks were placed with hay and straw in the same schema. The racks were made of wire mesh (mesh width: 2.5 x 5.0 cm and the filling opening were 5.0 x 25.0 cm (Figure 1).

The experiment started on the 27th day of pregnancy. During the preference test we observed which nest material was preferred by rabbit does for making nest. 24-h video recordings in the pens took place until the day of the parturition. The recording was achieved by using infrared cameras (KPC-S50 NV, B/W CCD) and special software (GeoVision GV-800 System, Multicam Surveillance System 6.1.). The evaluation started on the 27th day of pregnancy at 9:15. The other evaluated days started at 6:00 (light switched on). The last day ended at the moment of parturition (5 does/exp.). Every nest carrying occasion from the rack to the nest box was counted thereby the carrying occasions/hour were registered. Carrying occasions from the floor were also observed because some amount of nest material (especially Lignocel®) piled up on the floor. Carrying occasions from the nest box were also observed because rabbit does carried the nest material in and out the nest box.

We observed which nest material was found in the completed nest in the nest box. The nests were visually assessed immediately on the day of parturition, at the same time we took photo documentation from every nest. The nests which contained other nest material in more than 10% quantity were assessed as mixed nest.

The number of carrying occasions/hour of nest material from racks was evaluated by one-factor ANOVA and the presence of different nest materials in the nest boxes were evaluated by Chi-square test using SPSS 10.0 software package.The different groups were paired compared to each other.

Figure 1: Pen with empty nest box and hay racks filled with hay, straw and Lignocel®

RESULTS AND DISCUSSION

Experiment 1

The number of nest carrying occasions was significantly higher only on the day of parturition in the case of all nest materials (Table 1). Significant differences were recorded on the nest material carrying occasions between the nest materials on every experimental day except on the day of parturition

(Table 1). The number of nest carrying occasions from Lignocel® rack was higher than in case of hay or straw on the -4th, -3rd and -1st day. No straw and very little hay was carried on the -3rd and -2nd day. When the rabbit does spent their time in front of the rack (as eating or nest building activity) some amount of nest material (especially Lignocel®) piled up on the floor which was also carried to the nest box. In several cases the rabbit does carried out and into the nest material which was carried to the nest box before.

Table 1: Number of nest carrying occasions/hourfrom 27th day of pregnancy until the parturition

	Frequency of nest material carrying, occasion/hour						
	Experiment 1 (n=5 rabbit does)						
Days before parturition	Lignocel®	Hay	Straw	From the floor	Material from nest box	Prob.	SE
-4	0.18^{bAB}	0.01^{aA}	0.02^{abA}	0.02^{abA}	0.00^{aA}	0.020	0.02
-3	0.22^{bAB}	0.01^{aA}	0.04^{abA}	0.11^{abA}	0.18^{abA}	0.015	0.02
-2	0.00^{aA}	0.01^{bA}	0.00^{aA}	0.00^{aA}	0.00^{aA}	< 0.001	0.00
-1	0.10^{bAB}	0.00^{aA}	0.00^{aA}	0.07^{abA}	0.00^{aA}	< 0.001	0.01
Day of parturition	0.45^{B}	0.37^{B}	0.26^{B}	0.51^{B}	0.89^{B}	0.159	0.08
Prob.	0.017	< 0.001	0.003	< 0.001	< 0.001	-	-
SE	0.04	0.03	0.03	0.03	0.08	-	-
	Experiment 2 (n=5 rabbit does)						
Days before parturition	Lignocel®	Hay	Straw	From the floor	Material from nest box	Prob.	SE
-4	-	-	-	-	-	-	-
-3	-	-	-	-	-	-	-
-2	-	0.00^{aA}	0.08^{bA}	0.00^{a}	0.00^{aA}	< 0.001	0.01
-1	-	0.03^{aA}	0.22^{bA}	0.04^{ab}	0.01^{aA}	0.018	0.03
Day of parturition	-	0.84^{aB}	13.8^{bB}	0.22^{a}	0.41^{aB}	< 0.001	1.22
Prob.	-	< 0.001	< 0.001	0.089	0.003	-	-
SE	-	0.06	1.61	0.04	0.06	-	-

Lignocel®: is a fine, long fiber material made of wood; ^{A,B}: different superscripts within a column show significant differences (P<0.001); ^{a,b}: different superscripts within a row show significant differences (P<0.001); SE: standard error of the mean.

Significant differences were found in presence of carried nest materials in the nest boxes after parturition (Table 2). The most rabbit does used pure Lignocel® to build the nest, which tendency is similar to our previous experiment (Farkas *et al.*, 2015a). Only 11.1% of the finished nests contained hay or straw, but they were mixed with Lignocel®. None of rabbit does used pure hay or straw to build the nest which nest materials are similar to dry grass which is used by European wild rabbit (Hudson *et al.*, 2000). Hay was mixed with Lignocel® twice as much than straw with Lignocel®.

Table 2: Presence of carried nest materials in the nest boxes after parturition.

	Choice of nest material, %	
	Experiment 1	Experiment 2
Nest materials	Lignocel®1, hay, straw	Hay, straw
n (doe)	27	20
Lignocel® only	88.9^{b}	-
Lignocel® + hay	7.4^{a}	-
Lignocel® + straw	3.7^{a}	-
Hay only	0.0^{a}	20^{a}
Straw only	0.0^{a}	65^{b}
Hay + less straw	-	5^{a}
Straw + less hay	-	10^{a}

Prob.	< 0.001	< 0.001

[1]Lignocel®: is a fine, long fiber material made of wood; [a,b,c,d] Means with different letters differ significantly (P<0.001).

Every nest contained Lignocel® so it was greatly preferred material. It can be explained by its fibrous surface, which was tackier than straw and hay therefore does were able to hold it in their mouth and carry larger amount of it because it got entangled very well, and it was easier to make a nest from it such as in our previous experiment (Farkas *et al*., 2015a, b).

Experiment 2

The rabbit does started to make their nests two days later than in the experiment 1. The number of nest carrying occasions/hour was the highest on the day of parturition in case of every nest material (Table 1). On every day the nest material carrying occasions were significantly more frequent in the case of straw material.

More than three times more frequently does purely used the straw than hay (Table 2), which result is surprising because hay is more or less equal to dry grass which is preferred by European wild rabbit (Hudson *et al*., 2000). In 15% of cases, rabbit does collected nest material from the other hay rack as well. 80% of the finished nests contained straw, but only 35% of the cases hay was found in the nest boxes.

CONCLUSIONS

Most of the rabbit does use the Lignocel® nest material or mixed it with other nest materials. Straw and hay were not preferred so much to build a nest. Straw material is much more preferred by does than hay. The frequencies of nest material carrying occasions were the highest on the day of parturition.

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