EFFECT OF DIFFERENT NEST MATERIALS ON PERFORMANCE OF RABBIT DOES

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ABSTRACT

The experiment was conducted at the Kaposvár University. Pannon Ka and Pannon White rabbit does (n=200) were randomly divided into four groups, according to the nest materials used for bedding in the nest box: hay (n=50), straw (n=50), wood shavings (n=50), wooden thin long fibre material (Lignocel® J.Rettenmaier&Söhne GmbH, n=50). The experiment started on the 27th day of pregnancy. Photos were taken about the nests 4-5 days after parturition, and they were evaluated by experienced experts on scales of 1-5, depending on the nest quality. The quality of nests made of different materials was significantly different: the hay nest received the best quality scores (4.11), which was followed by straw (3.76), Lignocel® (3.56) and wood shavings (3.13). The nest material did not influence the litter size, the litter- and the individual weight at day 21, and suckling mortality between 0-21 days, however the reproductive performances of the two breeds were significantly different. It was concluded that the rabbit does built the best nest quality by hay and the worst by wood shavings; the type of the nest material did not influence the performance of does; and the commonly used wood shavings could be good in the practice.

Key words: Rabbit does, Nest material, Productive performance

INTRODUCTION

According to results of Gualterio *et al*. (1988), 54% of the preweaning mortality befalls during the first 12 hours after parturition, and 70 % until the end of the first week (Partridge *et al*., 1981). For the survival of new-born rabbits, the quality of nest is important (Zarrow *et al*., 1963; Delaveau, 1982; Verga *et al*., 1987; Borka and Ádám, 1988; Matics *et al*., 2002), because the main role of the nest and nest material is to protect the kits from cold during the first period of their life (Baumans, 2005), as they are hairless and very sensitive to cold (Blumetto *et al*., 2010).
The type of the nest material may be important from the aspect that the suckling rabbits may also eat nest material beside the left faecal balls by does which influence the evolution of their gut flora (Hudson *et al*, 2000; Kovács *et al*., 2004)

In most farms wood shavings are usually placed into the nest boxes because it is cheap and easy to purchase. European wild rabbits, however, mainly use dry grass to build the nest in the warren. Straw and hay are more similar to the materials they use in nature conditions (grass and plant material, Hudson et al., 2000). But wood shavings and dry grass are very different from each other; consequently wood shavings might not be a good nest material. Rabbit does are not able to build a proper nest from wood shavings (Deutsch, 1957, Hudson *et al*., 1996). According to Zarrow *et al*. (1963) and Verga *et al*. (1978) nest material and hair pulled from body of rabbit does are necessary to build good quality nest, and for successful rising of kits.

Different nest materials were examined by some researchers: Blumetto *et al*. (2010) used barley straw, Mahmoud and Tulip (2004) rice straw, Oliveria *et al*. (2014) tifton hay and chopped newspaper. In commercial rabbit farms the choice of nest material depends on the country and the possibilities. The

most commonly used materials are wood shavings, hay, straw, wool and cotton waste or even saw dust (Blumetto *et al*., 2010).

The objective of this study was to examine the effect of four different nest materials (wood shavings, hay, straw, Lignocel®) on nest quality and productive performance of rabbit does.

MATERIALS AND METHODS

Animals and experimental design

The experiment was conducted at the Kaposvár University. Pannon Ka and Pannon White rabbit does (n=200) were randomly divided into four groups according to the nest materials used for bedding the nest tray: hay (n=50), straw (n=50), wood shavings (n=50), Lignocel® (wooden, thin, long, fibre material made by J.Rettenmaier&Söhne GmbH; n=50). The temperature was 15-18 ºC, and 16-hour lighting was used in the room. The rabbit does consumed commercial pellet (energy: 10.6 MJ DE/kg pellet, crude protein: 18.0%, crude fat: 4.0%, crude fibre: 13.8%) ad libitum, and water was available from nipple drinkers.

Rabbit does were placed in 60x54x30 cm flat-deck cages equipped with 54x27 cm nest boxes including the 37x20x15.5 cm deep nest tray. The nest tray was made from plastic perforated underneath.

The experiment started on the 27th day of pregnancy, so the rabbit does had at least three days for preparing the nest. The rabbit does were inseminated on the 18th day after the parturition, using a 49-day reproduction rhythm. After equalization 8 and 9-10 kits were in a litter for nulliparous and multiparous does, respectively. The does could freely nurse their kits except for the three days before insemination when controlled nursing was used as a biostimulation method.

Photos of the nests were taken on 4-5 days after parturition, which were assessed by skilled experts on scores 1-5. The qualities of the nests were evaluated according to Sawin and Crary (1953), and Denenberg *et al*. (1963):
1: hair completely missing, no nest shape, kits were uncovered;
2: small amount of hair, shapeless nest, kits were hardly covered;
3: average amount of hair, meanly shaped nest, kits were are partly covered;
4: sufficient amount of hair, well-shaped nest, which covered the kits well;
5: large amount of hair, perfectly shaped nest, which covered the kits completely.

The quality and contamination of the nest material were checked daily. The contaminated nest materials were exchanged. Litter sizes (total, alive, stillborn, after equalization, at 21 day) and daily kits mortality were recorded. The 21-day litter weights were measured, and the individual weights were calculated.

Statistical Analysis

The productive performance and the quality of the nest were evaluated by one-way ANOVA, the suckling mortality by chi^2-test. All statistical analyses were conducted using the SPSS 10.0 software package.

RESULTS AND DISCUSSION

The quality of the nest using the four nest materials was significantly different. The hay nest proved to be the best, which was followed by straw and Lignocel®. The nests made from wood shavings were judged to be the poorest. There was near one score difference between hay and wood shavings nests

(Table 1). The nest material did not influence the litter size (total, alive, stillborn, after equalization, at day 21), the litter and the individual weight at day 21. Similarly to our results Olivera *et al*. (2014) and Matics *et al*. (2002) did not observe significant differences on the production of rabbit does depending on the nest materials. However, Bulmetto *et al*. (2010) observed significantly higher litter size at weaning in straw nest compared to wood shavings. The observed differences in evaluation of the nests were not reflected in the production results.

Table 1: Effect of nest materials on nest quality and production traits of rabbit does

	Nest material				Breed		SE	P-value	
	Wood shavings	Lignocel®[1]	Straw	Hay	Pannon White	Pannon Ka		Nest	Breed
n	44	45	45	46	109	71			
Nest quality	3.13[a]	3.56[b]	3.76[b]	4.11[c]	-	-	0.04	<0.001	-
Litter size									
total	10.6	9.58	9.71	10.46	9.19	11.5	0.26	0.523	<0.001
born alive	10.2	9.07	9.11	9.74	8.67	10.8	0.25	0.369	<0.001
stillborn	0.43	0.51	0.60	0.78	0.52	0.68	0.10	0.601	0.458
after equalization	8.95	8.71	8.80	8.85	8.52	9.30	0.05	0.381	<0.001
at 21 d	8.02	7.70	7.65	7.44	7.50	8.00	0.12	0.371	0.031
Litter weight at 21 d, kg	2.97	2.82	2.77	2.61	2.78	2.80	0.05	0.092	0.839
Individual weight at 21 d	373	373	359	356	373	353	4.9	0.303	0.048
Suckling mortality, 0-21 d	12.4	15.1	12.9	17.2	-	-	-	0.194	-

[1]Lignocel®: is a fine, long fiber material made of wood
[a,b,c] Means with different letters differ significantly (P<0.05).

Significant differences were observed between the two breeds which is identical to results of breeds of Pannon Breeding Program (Matics *et al*., 2014). Breed x nest material interactions were not detected.

Besides the measuring we experienced that it was wood shavings nest material that rabbit does were able to move the least or carry out of the nests so mostly it stayed in the nest completely such as in our previous experiment (Farkas *et al*., 2015). Before parturition the Lignocel® nest material had to be replaced most frequently because they removed it in a large quantity and it partly fell into manure channel chewed by the rabbits.

Significant difference was observed between the nulliparous and multiparous does in case of nest quality, but age x nest material interactions were not detected.

CONCLUSIONS

The rabbit does built the best nest quality by hay and the worst by wood shavings. However, the type of the nest material and the quality of the nest did not influence the productive performance of does. Based on the results, the commonly used wood shavings could be good in farm practice.

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