

**HAIR PULL OF RABBIT DOES AND ITS RELATIONSHIP WITH THEIR REARING
ABILITY**

Zsolt Szendrő, Károly Kustos^x, Soad Saad El-Din^{xx}

University of Agricultural Sciences, Kaposvár, Hungary

x Research Center for Animal Production and Nutrition, Gödöllő

xx University of Agricultural Sciences, Zagazig, EGYPT

Introduction

The mother of a wild rabbit makes her nest in the cavity hollowed in the earth. The cavity is substituted at the domesticated rabbit by the nest box. The nest building behaviour of the mother rabbit (arranging of litter material in the nest box, lining the box with hair pulled out from the body) is an important element of successful reproduction and rearing. The rearing ability of a mother rabbit, the survival of progenies depends, partly on the quality of the nest (Delaveau, 1979; Demohhisey, 1984). Several authors have described the elements of nest building ability behaviour of the mother rabbit (Vas-trade, 1984). They carried out examinations with the substitution of different litter materials instead of wooden chips (Verga et al., 1983). They examined the level of mortality in heated nest box (Partridge et al., 1983).

Despite of the interest of attempts of better rearing results, nest making remains the task of the mother rabbits, in the small and large scale enterprises in future, too. We examined in our experiment an essential element of nest making, the quantity of hair in the nest box. Beside the differences between the breeds and seasonal changes we have investigated the relationship between the hair quantity pulled by the mother and production traits.

Material and methods

We have carried out our examinations on two New Zealand White and one Californian stocks at the rabbit unit of the Research Center for Animal Production and Nutrition. The rabbit does were placed in closed rabbit houses, in pointwelded wire grid cages, where the temperature was 15-16 °C in winter. The nest box was made of artificial material (with crushed bottom sheet) and was hanged up from outside on the cage of does 2-3 days before parturition. Pine wood shavings were placed as litter material into the nest box. The quantity of hair in the nest box was scored after every parturition from 0 to 5 points.

- 0 = when there was no hair at all in the nest box,
- 1 = there was hardly any hair in the nest box,
- 2 = there was enough hair between the shavings, but the young rabbits were not covered up at all,
- 3 = the suckling rabbits were a little covered up,
- 4 = the nest was covered up, but some rabbits were still visible,
- 5 = the nest was covered up thickly with hair.

We classified the quantity of hair in the nest box in two New Zealand white lines during 674 and 603 parturitions, in the Californian stock during 144 kindlings and at the same time we recorded the litter size at birth and at 21 days of age, the mortality between 0 and 21 days of age and the litter weight gain, as well.

Results

During the examined period the Californian does pulled significantly less ($P < 0,01$) hair (2.89) than the two lines belonging to the New Zealand White breed (3.52 and 3.51). According to the data demonstrated in Table 1, the proportion of mothers having pulled less hair (class 0-1-2) in the New Zea-

land White stocks, remained under 20 %, while in the Californian breed it came near 40 %. The proportion of mothers making good nest (scores 4 and 5) developed inversely in the two breeds, in the New Zealand White lines the values were above 50 %, in the Californian 36.8 % was observed.

The quantity of hair in the nest box changed in the course of year (Figure 1). The most hair (above 3.5) was got between April and July, the least (3.19 and 3.15) in August and September.

On the basis of the examination between the quantity of hair in the nest box and the production properties (Table 2) we can establish that the litter size at birth was independent from the hair pulling of mother. In the case of the litter size at 21 days of age and litter weight gain significant differences were found between the groups, but in the background of these differences the mortality during suckling age (rearing ability) is lying. The achieved results in the case of the hair classes (Figure 2) are showing unanimously that less suckling rabbits died in the nest where the animals were covered up better. The difference between the rearing results of groups was in most cases significant.

Conclusions

The difference between hair pulling of New Zealand White and Californian does shows that the difference of fur quality of the breeds (the New Zealand White rabbits have thicker hair than the Californian ones) manifests itself in the nest making of mothers.

Our experimental results did not justify the relationship, that mothers are pulling more hair in winter than in other

seasons. The monthly change of hair quantity in the nest box have a similar tendency, as the seasonal fluctuation of covering ability (Csonka and Szendrő, 1984) that is the quantity of pulled hair and the state of moulting are related very likely to each other. It could be stated, as well, that in cold weather the female rabbits are striving to make good nest, are pulling only so much hair from their bodies that they should not feel extremely cold.

A definite relationship was found between the quantity of hair in the nest box and the mortality of the suckling rabbits. While from the 0 and 1 hair class groups 30 % or more was the suckling rabbit mortality, from the 3, 4 and 5 hair classes less than 20 %. The indirect advantage of the rearing ability of mothers pulling out more hair was, that the number of suckling rabbits till 21 days of age increased and so did the live weight gain of litters, as well.

Our results are directing our attention to the fact that in the case of a badly covered nest, the hair of the mother must be pulled out with hand, or to maintain the adequate temperature of nest some kind of hair supplemental material must be put into the nest.

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Table 1.

The distribution of litters in the nest box on the basis
of the hair quantity, %

Stock	Hair quantity (class)						Average hair quantity
	0	1	2	3	4	5	
New Zealand White (1)	2,8	1,3	14,0	31,5	23,8	26,6	3,52
Californian	9,0	2,8	27,0	23,6	24,3	12,5	2,89
New Zealand White (2)	2,3	-	15,1	28,8	28,3	24,5	3,51

Table 2. Relationship between the hair quantity in the nest box and the productive characters

Characters	Hair quantity in the nest box (classes)					
	0	1	2	3	4	5
Number of litters	19	9	96	215	163	182
Litter size at birth	8,42 ± 2,59	6,22 ± 2,11	8,35 ± 2,45	8,11 ± 2,47	8,18 ± 2,53	7,96 ± 2,60
Litter size at 21 days of age	6,21 ± 2,10	3,78 ± 2,22	6,52 ± 2,24	6,47 ± 2,23	6,30 ± 2,35	6,48 ± 2,30
Litter weight gain, g (0-21 days of age)	1774 ± 458	1069 ± 517	1854 ± 539	1782 ± 531	1724 ± 565	1815 ± 523
Rearing proportion (%)	75,6	60,3	78,9	81,2	79,1	82,8
<u>New Zealand White, 1</u>						
Number of litters	13	4	40	34	35	18
Litter size at birth	8,85 ± 2,19	6,50 ± 2,08	8,35 ± 2,55	8,24 ± 2,28	8,54 ± 2,95	7,61 ± 2,55
Litter size at 21 days of age	5,46 ± 1,81	3,75 ± 1,26	5,82 ± 2,06	6,47 ± 1,56	6,00 ± 2,14	5,83 ± 2,07
Litter weight gain, g (0-21 days of age)	1669 ± 523	1147 ± 466	1546 ± 503	1705 ± 379	1561 ± 589	1620 ± 531
Rearing proportion (%)	62,8	65,1	73,4	80,6	74,7	79,0
<u>Californian</u>						
Number of litters	20	-	91	173	170	147
Litter size at birth	8,45 ± 2,58	-	8,11 ± 2,54	8,04 ± 2,63	7,81 ± 2,29	8,29 ± 2,75
Litter size at 21 days of age	5,75 ± 2,57	-	6,03 ± 2,51	6,30 ± 2,09	6,31 ± 2,10	6,59 ± 1,99
Litter weight gain, g	1567 ± 571	-	1707 ± 614	1779 ± 540	1826 ± 559	1921 ± 543
Rearing proportion (%)	69,5	-	75,2	80,6	82,5	82,7
<u>New Zealand White, 2</u>						
Number of litters	52	13	227	422	368	347
Litter size at birth	8,54 ^b	6,80 ^a	8,26 ^b	8,09 ^{a,b}	8,04 ^{a,b}	8,08 ^{a,b}
Litter size at 21 days of age	5,85 ^b	4,27 ^a	6,20 ^{b,c}	6,40 ^{b,c}	6,27 ^{b,c}	6,49 ^c
Litter weight gain, g	1671 ^b	1131 ^a	1741 ^{b,c}	1774 ^{b,c}	1756 ^{b,c}	1850 ^c
Rearing proportion (%)	70,1 ^a	63,4 ^a	76,4 ^b	80,9 ^{c,d}	80,3 ^c	82,5 ^d
<u>Three stocks together</u>						

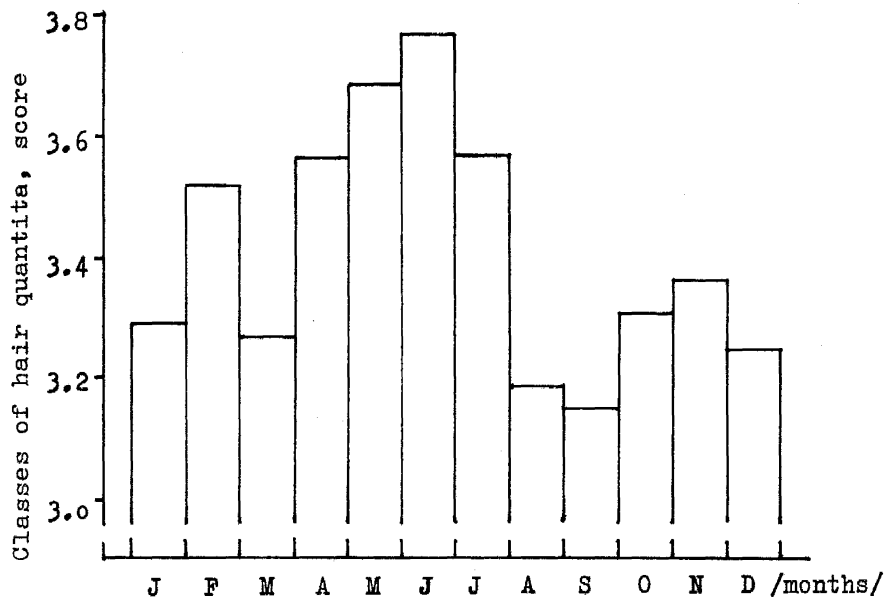


Fig. 1. The monthly formation of hair quantity in the nest box /the three lines were summed up/

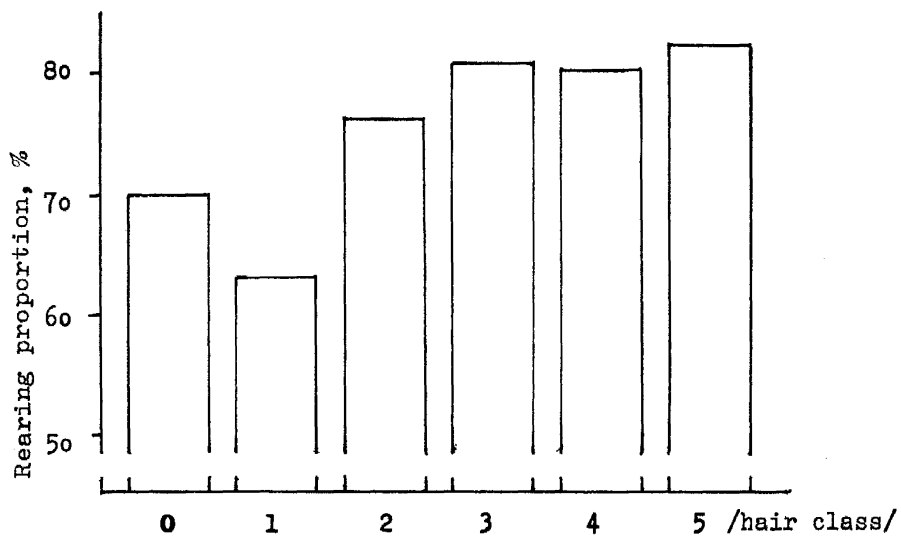


Fig. 2. Relationship between hair pulling of mother and their rearing ability /the three lines were summed up/

HAIR PULL OF FEMALE RABBITS AND ITS RELATIONSHIPS WITH THE
REARING ABILITY

Zsolt Szendrő - Károly Kustos - Soad Saad El-Din

University of Agr. Sciences Kaposvár, Hungary,
Res. Centre Anim. Breeding Nutrition, Gödöllő
University of Agr. Sciences Zagazig, Egypt

The authors investigated the quantity of hair in the nest-boxes of 2 New Zealand White /NZW/, and 1 Californian /Cal/ populations for 1 calendar year. The rabbits were kept in a closed house that could be heated in winter. The quantity of pulled hair was scored from 0 to 5. The Cal females pulled less hair /2.89/ than the NZW animals /3.51 and 3.52 resp./. The greatest quantity of hair was found in April - July /3.57, 3.69, 3.77 and 3.57/, the lowest quantity /3.19 and 3.15/ in August and in September in the nest-boxes. No correlations were found between the litter size at birth, litter size at the age of 21 days, the litter weight gain from birth to 21 days of age and the hair quantity. It could be stated that the suckling losses were lower in the nests covered better with hair. The suckling losses from score 0 to 5 amounted to 29.9, 36.6, 23.6, 19.1, 19.7 and 17.5 %.

HAARRAUFEN BEI WEIBLICHEN KANINCHEN UND SEINE ZUSAMMENHÄNGE
MIT DEM AUFZUCHTVERMÖGEN

Verfasser untersuchten die Haarmenge in Wurfboxen in einem geschlossenen, im Winter beheiztem Stall in 2 Beständen /Weissen Neuseeländer, Kalifornier/, während eines Kalender-Jahres.

Die Haarmenge der Muttertiere in Wurfboxen wurde nach Punkten von 0 bis 5 bewertet.

Die Kalifornierhäsinnen haben weniger Haarmengen gerauft /2,89/ als Weissen Neuseeländer /3,51 und 3,52/. Die grössten Haarmengen /3,57, 3,69, 3,77, 3,57/ konnten von April bis Juli und die kleinste Mengen /3,19 und 3,15/ in August-September festgestellt werden. Keine Beziehungen zeigten sich zwischen der Wurfgrösse bei Geburt, der Wurfgrösse im Alter von 21 Tagen, der Massenzunahme bis zum Alter von 21 Tagen und der Haarmenge. Es wurde jedoch beobachtet, dass die Verluste in den besser bedeckten Nestern niedriger lagen. Die Verluste während der Säugezeit betragen bei 0-5 Punktzahlen 29,9, 36,6, 23,6, 19,1, 19,7 und 17,5 %.



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