

Effect of re-insemination interval after the first parturition on the performance of rabbit does

Matics Zs.¹, Kustos K.³, Gerencsér Zs.², Radnai I.², Nagy I.², Szendrő Zs.²

¹HAS-ORG, Research Group of Animal Breeding and Hygiene, Kaposvár, Hungary

²Faculty of Animal Science, Kaposvár University, Hungary

³Lab-Nyúl Ltd., Gödöllő, Hungary

Corresponding Author: Zsolt Matics, Kaposvár University, H-7400 Kaposvár Guba S. Str. 40, Hungary - Tel. +36 82-505 800 - Fax: +36 82-320 167 - Email: matics.zsolt@ke.hu

ABSTRACT – The objective of the study was to examine the effect of the length of period between the first kindling and the next insemination on the performance of rabbit does. Rabbit does (n=311) were randomly sorted to 3 groups and were inseminated 11 (AI-11), 18 (AI-18) or 25 days (AI-25) after the first parturition. Subsequent inseminations occurred 11 days after kindling. The kindling rates (between the 2nd and 7th kindling) of the AI-11, AI-18 and AI-25 groups were 68.0; 74.1 and 76.3 (NS), respectively. No significant differences were found for the does' body weight, litter size (total, born alive, at day 21), suckling mortality, litter and individual weight at day 21. Despite of the small differences that were recorded for these traits, the productivity per 100 inseminations substantial alterations were observed for the total number of kits born (687, 738 and 786), total number of kits born alive (642, 705 and 724), total number of kits at day 21 (642, 705 and 724) and total kit's weight at day 21 (221, 230 and 239 kg) among the AI-11, AI-18 and AI-25 groups. Based on the results after the first kindling it is worth to re-inseminate the does 1-2 weeks later for improving their condition and production level.

Key words: Rabbit does, Reproductive performance, Insemination interval.

INTRODUCTION – The most important factors that determines the rabbit does' production is their body condition (Pascual, 2010), and the age at first insemination (Rommers *et al.*, 2002; Bonanno *et al.*, 2004). High longevity and high level production can only be expected if the energy depots of rabbit does is sufficient. During the final phase of gestation that coincides with the lactation peak the does show energy deficit (Xiccato, 1990), thus feed intake cannot provide them with their energy demand. The primiparous lactating does loose an exceptionally large part of their fat depots that can be explained with the growth of their own body as they inseminated after reaching 75-80% of their adult weight. The does condition is the most critical after the first kindling therefore in the present study the authors examined the effect of the length of the period between the first kindling and the next insemination (day 11, 18 and 25) on the does' production.

MATERIALS AND METHODS – The experiment was conducted at the rabbit farm of the Labnyúl Ltd using 311 Pannon White rabbit does. The does were housed in cages having a basic area of 90×40 cm. The temperature ranged between 15 and 28°C depending on the season. The does were mated first at age of 16.5 weeks. Generally 10

hour lighting period was applied which was increased to 16 hours 8 days prior to insemination with the aim of biostimulation. At the time of kindling the does were intramuscular injected 0.2 ml Receptal (GnRH analogue). The rabbit does were randomly sorted into three groups and were inseminated 11, 18 or 21 days following their first kindling (AI-11, n=101; AI-18, n=109; AI-25, n=101). Afterwards all does were inseminated at day 11 after kindling. The size of the litters was equalized: the maximum number of kits per litter was 10. Productive traits were evaluated by means of multifactor ANOVA, kindling rate and suckling mortality was analyzed by chi-square test. The period until re-insemination was considered as fixed effect while the parity was treated as a random factor. In the evaluation the first kindlings were not considered because they were independent of the time of re-insemination. Statistical analyses were conducted using SPSS 10.0 software package.

RESULTS AND CONCLUSIONS – Results are summarized in Table 1.

The average kindling rate between the 2nd and the 7th parturitions of the AI-11, AI-18 and AI-25 groups were 68.0, 74.1 and 76.3%, respectively. The results justify both the short and long term favourable effects of the longer period applied after the first parturition on the kindling rate. The body weight of the AI-25 does were slightly higher than that of the other groups but the differences were not significant. No differences were found for litter size among the groups. Suckling mortality showed significant differences at the 2nd and 5th kindlings but pooling the results for all kindlings the differences among the groups were small. No significant differences were found for individual and litter weight at day 21. Other authors (Xiccato *et al.*, 2005; Castellini *et al.*, 2006; Feugier and Fortun-Lamothe, 2006; Szendrő *et al.*, 2008) conducted several experiments where the insemination at day 11 was compared to a more extensive reproduction rhythm. In these experiments the period between kindling and re-insemination was different throughout the whole productive period contrary to the present study where the difference was confined to the first kindling. In these abovementioned experiments the authors observed that in the extensive groups the body weight of the does increased, the condition and kindling rate improved but the litter size generally did not alter. Contrary to these favourable results the annual production decreased. In our study the longer period was only applied after the first kindling that could be compensated by the does during the latter production phase. The observed small differences among the groups can be summed into the total production per 100 inseminations. Using this parameter the superiority of the AI-25 group over the AI-11 group was obvious. The observed substantial differences between these groups were 14.4, 12.8, 14.1 and 8.1% for total number of born kits, number of kits born alive, number of kits alive at day 21 and litter weight at day 21 ($P < 0.05$). Thus it can be concluded that applying a lengthened period after the first kindling (by 1 or 2 weeks) had a favourable effect on the does' production.

Financial help of TECH_08_A3/2-2008-0384 (OM-00198/2008) is gratefully acknowledged.

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Table 1 – Effect of time of insemination after first parturition on the performances of does.

Parturition	Groups (re-insemination, days)			SE
	11	18	25	
Kindling rate, %				
2	54.5b	62.8a	66.2a	-
2-7	68.0	74.1	76.3	-
Body weight of does, kg				
2	4.18	4.20	4.26	0.02
2-7	4.27	4.27	4.34	0.02
Litter size, total				
2	8.3	8.2	9.1	0.19
2-7	10.1	10.0	10.3	0.14
Litter size, alive				
2	8.1	7.8	8.7	0.19
2-7	9.45	9.51	9.49	0.08
Litter size at 21d				
2	7.00	7.17	7.47	0.12
2-7	7.41	7.46	7.53	0.10
Suckling mortality, %				
2	7.5ab	5.9a	9.0b	-
2-7	10.1	12.2	10.9	-
Litter weight at 21 d, kg				
2	2.94	3.05	3.02	0.04
2-7	3.11	3.11	3.13	0.04
Individual weight at 21 d, g				
2	436ab	438b	411a	4.6
2-7	429	427	424	3.6
Per 100 AI				
number of kits born	689a	738b	785c	10.5
number of kits, alive	643	704	724	9.77
number of kits at 21d	504a	553b	575b	6.93
total weight at 21d	211a	230b	239b	2.57

a-c: Different letters within a row show significant differences ($P < 0.05$)