

EFFECT OF LITTER SIZE AT MATING ON THE REPRODUCTIVE PERFORMANCE
OF DOES

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Introduction

In several rabbit farms the re-mating interval of does depend on the litter size (LS) at the time of mating. In the case of LS are 1-4, 5-7, 8-9 or more than 9 the does are mated immediately after kindling or 10-12, 20-22 and more than 30 days after parturition, resp. There are few experimental data about this method. Examining the connection of production traits between two consecutive kindlings by Aumann et al. (1984), for previous LS an inverse effect was found on the conception rate (CR) and following LS in the case of post-partum insemination. Bíró et al. (1988) studied the effect of LS at mating on the CR if the re-mating interval was 14 days. It was found that the larger the LS the lower was the CR. It can not be found out from the data that possibility of mating (PM) takes part in the rate of kindled does or not.

Since in case of natural mating the rate of kindled does depends on the PM and the CR, the two traits were taken into consideration in our investigation. Under intensive and semi-intensive breeding were examined the effect of LS at mating on the PM, CR and LS.

Materials and Methods

The experiment was carried out on two New Zealand White strains (A and B) with different age. The rabbits were housed in closed building in flat-deck wire cages. The does were fed ad libitum a commercial diet. An automatic watering system provided a dependable supply of water. One group of does was mated immediately after kindling (intensive breeding) other ones 10-12 days after parturition (semi-intensive breeding). In the intensive and semi-intensive breeding system and strains A and B

664 and 554, 504 and 347 matings were examined. The does in both groups (intensive and semi-intensive) were mated during 1 week (5 working days). The rate of does accepted the buck is called "possibility of mating". The CR was expressed by taking the percentage of kindled does from that were mated. Only those does were evaluated where the LS at birth and the age of 21 days were equal or only 1 kit died during the suckling period; it is called LS at mating. The production data (PM, CR and LS) were grouped according to LS at mating (1-2, 3-4, 5-6, 7-8, 9-10, 11-12 and 13 kits).

Results and Discussion

In the groups of does mated immediately after kindling the proportion of mated does and CR decreased as LS at mating increased and an inverse tendency can be seen in the LS (Table 1 and Fig 1.). For groups of does nursed 1-2 kits, PM averaged 78.6 % and 90 %, while for that suckled 11-12 kits it was only 44.4 % and 50 %. According to the regression coefficient, if the LS at mating was increased by one the PM decreased by 2.79-4.06 %. The decrease of CR was even more definite. For the groups of does nursed 1-2 and 11-12 kits, CR averaged 77.8-81.8 % and 20-50 % resp. The value of regression coefficient were -6.21 % and -2.93 % in the A and B strain, resp. The proportion of kindled does from all ones decreased from 64.3-70 % to 10-22.2 %. An opposite tendency can be observed in LS. The LS increased as previous LS increased (from 5.19-6.32 to 7.59-7.65 in groups of does nursed 3-4 and 9-10 kits).

The obtained results of CR confirm the findings of Aumann et al. (1984) which refer a negative correlation between previous LS and CR of does inseminated immediately after kindling. Concerning the influence of LS at insemination on the following LS is inconsistent with our data. According to their results, if the previous LS increased by one the total LS in the following litter decreased by 0.08-0.20. But the data of repeatability published by several authors (Holdas and Suschka, 1978; Baselga et al., 1982; Lukefahr et al., 1983; Szendrő et al., 1988a) indicate that there are positive correlations between previous LS and following LS.

In the group of does mated 10-14 days after kindling the PM decreased faster than in the post-partum groups as LS in the previous litter increased (Table 1 and Fig 2). In the groups of does nursed 1-2 and 9-10 kits, PM averaged 100 % and 46.3-48.6 % resp., but in the groups of does

suckled more than 10 kits a slight increasing could be observed. The latter tendency is not by chance because some experimental data show that does kindled large litter (more than 10 kits) are able to achieve good results in other productive traits as well; total litter loss occurs seldom in these litters (Szendrő and Barna, 1984), the reproduction ability of does which was born and reared up in large litters show an improving tendency (Szendrő et al., 1988b; Bíró and Szendrő, 1990).

In the groups of does re-mated 10-14 days after parturition no considerable connection can be seen between LS at mating and CR. In general, CR were between 60 and 70 % in each group of does nursed different number of kits. Thus in the semi-intensive groups, CR seemed not related to LS at mating as it could be observed in the intensive groups. Our results apparently are inconsistent with data given by Mrs. Bíró et al. (1988). On the other hand number of kindled does from all ones was similar to the results of CR published by Mrs. Bíró et al. (1988). It is presumed that there is a difference only in the method of calculation which means that their results decreased too because of the decrease of PM. In the semi-intensive groups, similar to the intensive groups, LS at mating had a significant effect on the following LS (increased with increasing previous LS; Table 1).

The results of the investigation show that in case of intensive breeding PM are higher than in semi-intensive system. These results confirm our earlier data (Szendrő, 1983). But CR are higher in groups re-mated 10-14 days after kindling than those mated immediately after parturition. The reason for this is the complete overlapping of pregnancy and milk production of does (suckling and gestation are at the same time). Similar results were published by Surdeau et al. (1980 and 1984), Szendrő et al. (1983 and 1984), Partridge et al. (1984), Desalvo and Zucchi (1985).

The aim of the investigation was to confirm or to refuse the practical method of rabbit farmers to choose the re-mating interval depending on the LS at mating. On the basis of present study and data of literature following conclusions are made:

- In the case of intensive breeding there is an unfavourable effect between LS at mating and PM and CR. If the does nursed more than 6 kits their reproductive ability reduced significantly. Thus it would be better to choose longer (at least 10 days) re-mating interval if LS are large (more than 7). But the disadvantage of large litters can be diminished by determining (palpating) pregnancy at 10-12 days after mating.

- In the case of does re-mating 10-14 days after parturition, LS at mating had a significant effect on PM (decreasing with increasing LS) and following LS (increasing with increasing previous LS), but was not significantly correlated with CR. Thus in semi-intensive system all does can be mated independent of number of nursed kits.

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Table 1

Effect of litter size (LS) at mating on the possibility of mating (PM), conception rate (CR), kindled does of all ones and following litter size

LS at mating	Strain "A"						Strain "B"					
	No of does	PM %	CR %	Kindled does, %	No of kindled does	LS	No of does	PM %	CR %	Kindled does, %	No of kindled does	LS
<u>Does mated immediately after kindling</u>												
1-2	14	78.6	81.8	64.3	9	6.56	20	90.0	77.8	70.0	14	6.57
3-4	82	79.3	70.8	56.1	46	6.32	65	81.5	58.5	47.7	31	5.19
5-6	180	72.2	63.1	45.6	82	6.88	159	75.5	54.2	40.9	65	6.55
7-8	264	70.8	52.9	37.5	99	7.21	193	75.1	44.8	33.7	65	7.47
9-10	114	62.3	32.4	20.2	23	7.65	108	63.0	39.7	25.0	27	7.59
11-12	10	50.0	20.0	10.0	1	6.00	9	44.4	50.0	22.2	2	7.00
<u>Does mated 10-14 days after kindling</u>												
1-2	6	100.0	50.0	50.0	3	6.67	5	100.0	80.0	80.0	4	5.75
3-4	48	85.4	70.7	60.4	29	7.07	34	70.6	70.8	50.0	17	7.12
5-6	110	63.6	60.0	38.2	42	6.83	76	59.2	68.9	40.8	31	7.86
7-8	174	54.6	76.8	42.0	73	7.29	130	56.2	68.5	38.5	50	8.06
9-10	142	48.6	59.4	28.9	41	8.15	95	46.3	75.0	34.7	33	7.85
11-12	21	52.4	72.7	38.1	8	7.88	7	57.1	100.0	57.1	4	9.50
13	3	66.7	100.0	66.7	2	12.00	-	-	-	-	-	-

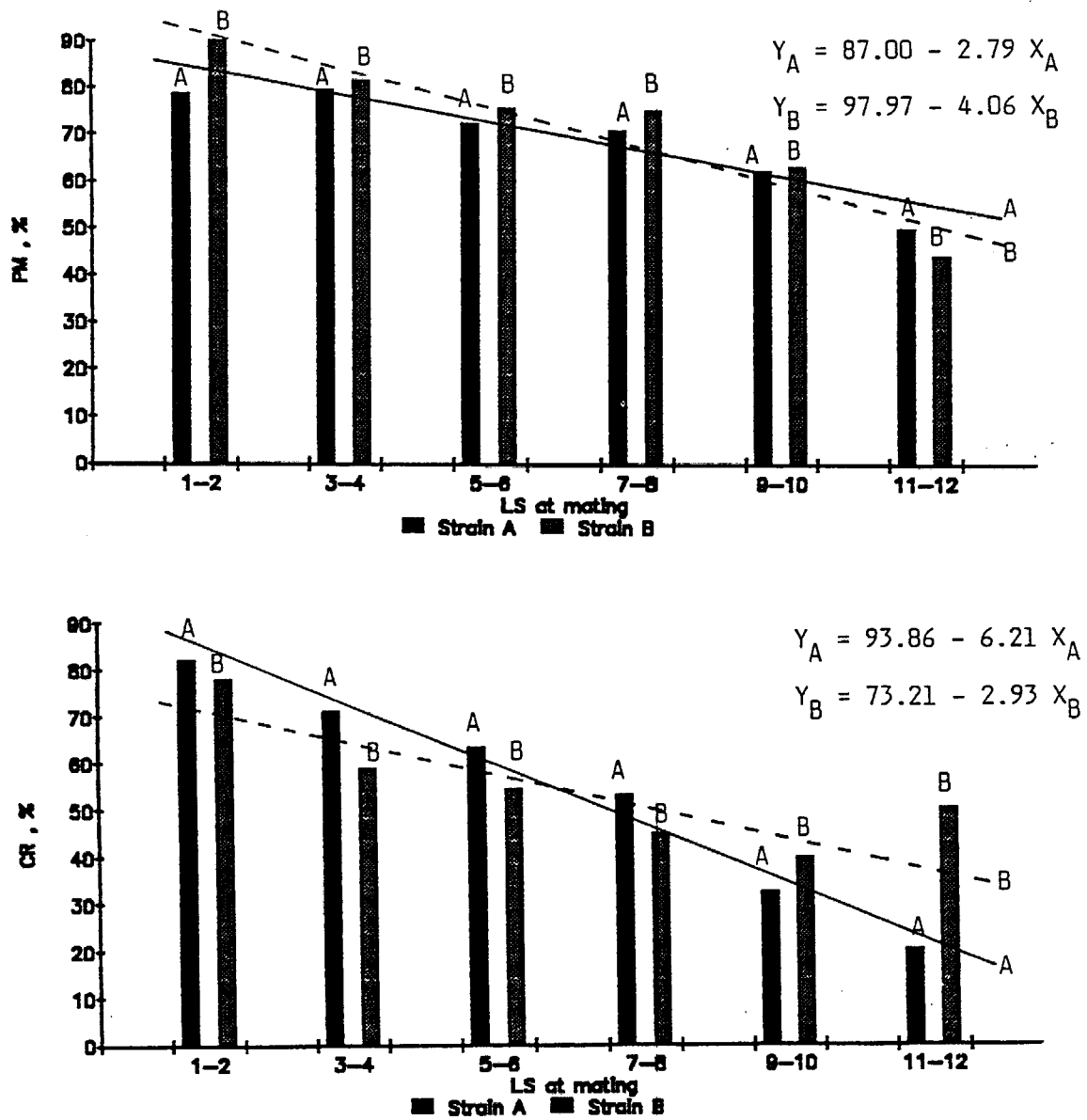


Fig 1 Rate of does (PM) mated immediately after kindling and their conception rate (CR) depending on the litter size at mating

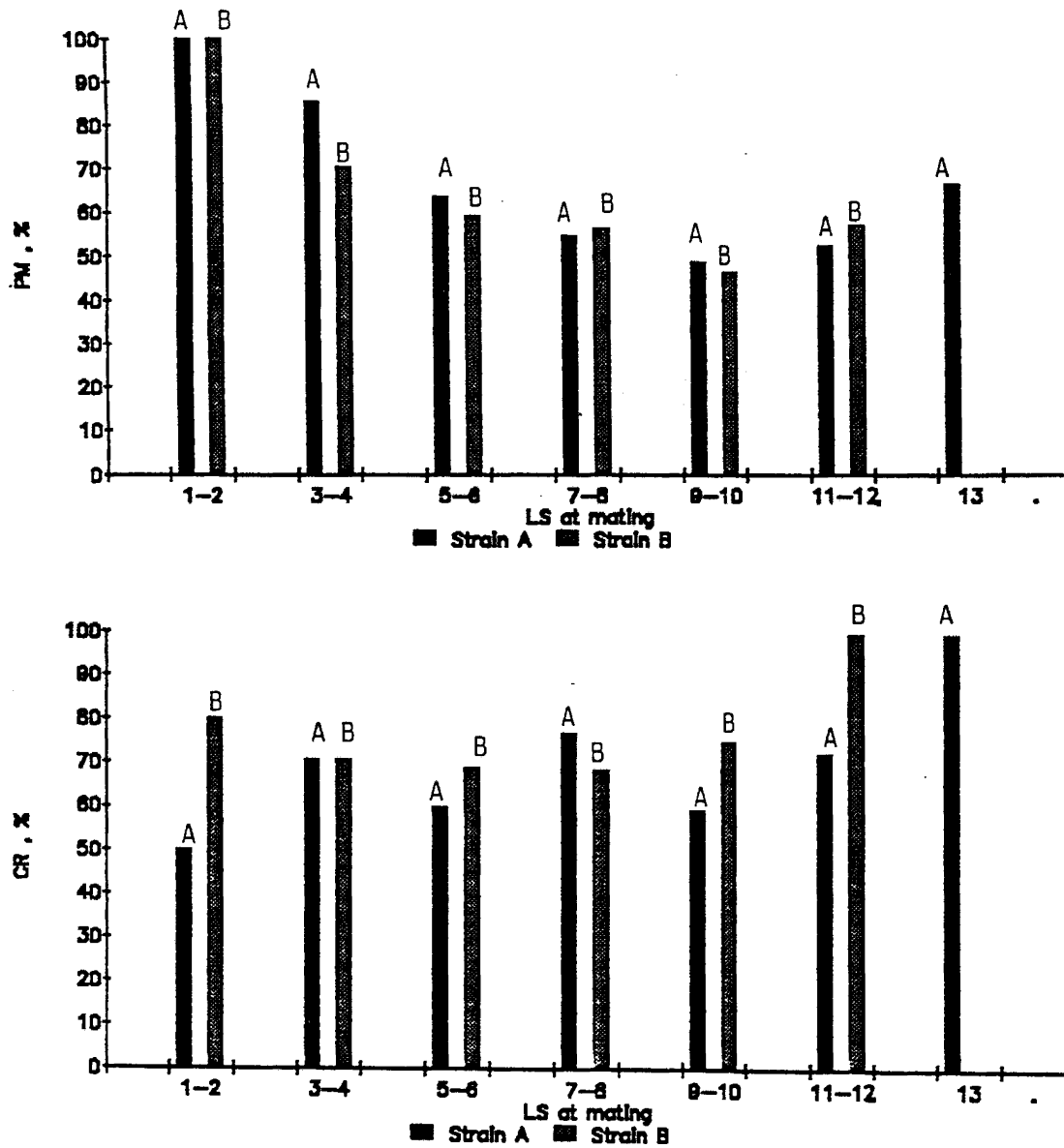


Fig 2 Rate of does (PM) mated 10-14 days after kindling and their conception rate (CR) depending on the litter size at mating