

**INFLUENCE OF THE PARTURITION - INSEMINATION INTERVAL ON THE CONCEPTION RATE  
IN RABBITS ARTIFICIALLY INSEMINATED WITH FRESH SEMEN.**

Rebollar P.G.; Ubilla, E.; Rodríguez, J.M.

Departamento de Producción Animal, Escuela Técnica Superior de Ingenieros Agrónomos, Universidad Politécnica de Madrid, Ciudad Universitaria s/n, 28040 Madrid, Spain

**INTRODUCTION**

Conception rates (C.R.) obtained after artificial insemination (A.I.) in rabbits differ greatly among authors, rabbit farms and time of the year, and little information is available that could explain such differences. A.I. is a technique which is still in the development stage in these animals in Spain. A.I. in lactating rabbits present many problems in the ovulatory response after GnRH injections (Rodríguez, J.M. & Ubilla, E. 1988). Low C.R. are observed in rabbits inseminated after a short parturition - A.I. interval, while does inseminated on later lactation days (days 18-20) present higher C.R. and prolificacy rates (Blocher, S.A. & Franchet, A. 1990; Roustan, A. & Maillot, D. 1990).

The aim of this study was to compare the influence of the A.I. using fresh semen, in nulliparous and multiparous lactating or no lactating rabbits, submitted to an intensive or semiintensive reproductive rythms.

**MATERIAL AND METHODS**

534 A.I. were performed in nulliparous and multiparous rabbits of the California x Newzealand breed. Inseminations were carried out on 1 day of the week. Semen was collected using an artificial vagina. After checking the semen quality (ejaculate volume, colour, density and spermatozoa motility) (Sinkovics, G. 1987; Díaz, M. et al., 1989), each doe was inseminated with 1.0 ml diluted semen 1:10 [skim milk + antibiotic (500 UI Penicillin Procaine + 500 UI Penicillin Benzatine + 0.01g Streptomycin Sulphat/ ml diluted semen). Ovulation was induced with 20µg GnRH (Gonadoreline, Fertagyl, Intervet Lab.). Nulliparous rabbits were inseminated at 4 months of age, multiparous with less then 8 pups/litter 3-4 days after parturition, and multiparous with more then 8 pups/litter on days 10 or 11 after parturition. Pregnancy diagnosis was determined by abdominal palpation on day 11 after A.I.. Non pregnant rabbits were inseminated again 21 days after the first non fertile insemination (days 24-25 or 31-32 of lactation).

Statistical analysis of the results was carried out using a Mann-Withney test (Siegel, S. 1956) for comparison of means and the modified Chi-squared test by Yates (Yates, F. 1937) to compare proportions.

**RESULTS**

A total of 534 artificial inseminations were carried out, of which 98 were performed in nulliparous rabbits, 114 on days 3 or 4 after parturition, 116 on days 10 or 11 after parturition, and 206 on day 21 after a previous non fertile insemination. The results are shown in Table 1 and 2.

	Conception rate (%)	Litter size at birth (x ± S.E.M.)	Born dead/litter (x ± S.E.M.)
Nulliparous	62.37 (98)	6.19 ± 0.33 [56]	0.46 ± 0.17
Multip: AI on days 3-4 or 10-11 p.p.	50.43 (230)	6.83 ± 0.22 [111]	0.99 ± 0.20
Multip: AI on day 21 p.p.	62.13 (206) *	7.19 ± 0.30 [122]	0.82 ± 0.17
TOTAL	57.12 (534)	6.84 ± 0.18 [289]	0.82 ± 0.11

Table 1. Conception rate (% of pregnant rabbits after palpation), litter size at birth, No. born dead/litter, in nulliparous, or in multiparous rabbits with A.I. on day 3-4 postpartum (p.p.) or 10-11 p.p., or 21 days after a non fertile insemination.

\*: p<0.05. ( ): No. inseminations; [ ]: No. parturitions

	Conception rate (%)	Litter size at birth (x ± S.E.M.)	Born dead/litter (x ± S.E.M.)
Lactating	46.03 (189)	6.92 ± 0.34 [84]	1.05 ± 0.24
Non lactating	70.73 (41) *	6.5 ± 0.49 [27]	0.8 ± 0.49

Table 2. Conception rate (% of pregnant rabbits after palpation), litter size at birth and No born dead/litter in lactating and non lactating rabbits inseminated on days 3-4 or 10-11 after parturition. \*: p<0.05. ( ): No. of A.I.; [ ]: No. of parturitions.

No significant differences were found in the conception rate of nulliparous rabbits compared to the other groups, probably caused by the low number of A.I. carried out in this group (98). These results were very similar to multiparous rabbits inseminated 21 days after a non fertile A.I. A higher C.R. was found in this last group compared to multiparous rabbits inseminated 3-4 or 10-11 days p.p. (p< 0.05). No differences were observed in the C.R. between rabbits A.I. on day 3-4 versus day 10-11 p.p. (50.0 % vs 50.2 %).

No significant differences were found when comparing litter size at birth or number of born dead/litter between groups.

A low C.R. in lactating rabbits A.I. on days 3-4 or 10-11 after parturition versus non lactating inseminated during the same postpartum period were observed (p< 0.05) and no significant differences were found when comparing litter size at birth or number of born dead/litter between groups (Table 2).

## DISCUSSION

The mean conception rate obtained using A.I. as a routine technique for the control of reproduction in the rabbit, did not show extremely high rates when considering those found by Sinkovics, C. (1987), Uzcategui, M.E. & Jonhston, M.P. (1988), Schlolaut, W. (1989), Bechstedt, U. (1989), Castellini, C. (1990), Chmitelin, F. et al. (1990), with percentages of 72.2 %, 78.7 %, 71.5%, 86 %, 69 % and 70.08 %, respectively. In many of these studies does were previously stimulated using PMSG, FSH, or prostaglandins, and in other cases the number of A.I. carried out was not sufficiently large.

The results found in this trial are in agreement with those of Costantini, F. (1986), Bonanno, A. & Costanzo, D. (1987), Zanirato, G. (1987), Anselmino, M. & Tomatis, R. (1989), Roustan, A. & Maillot, D. (1990), who obtain a mean C.R. of 49.2 %, 52.99 %, 57.6 %, 50.7 %, 48.7 %, respectively. A great number of variations were also observed by the authors, depending on sexual receptivity, on the parturition interval, time of the year and age, when measuring C.R. Nulliparous rabbits are normally highly sexually receptive, with higher C.R. compared to multiparous lactating rabbits (Costantini, C. 1986; Facchin, E. 1988; Roustan, A. & Maillot, D. 1990; Chmitelin, F. et al., 1990). The same tendency was observed in our study.

The lower C.R. found after A.I. on days 3-4 or 10-11 p.p., compared to does A.I. on day 21 after a non fertile insemination could be explained by the high proportion of lactating does (82.2 %) inseminated on days 3-4 or 10-11 p.p.. Therefore, this low C.R. could be related to the high plasma prolactin levels described in the first two weeks of the lactation period (Mc.Neilly, A.S. & Friesen, G.H., 1978). Our results are in agreement with those obtained by Blocher, F. & Franchet, A. (1990), and Roustan, A. & Maillot, D. (1990), who observed a 37.4 % to 48.3 % C.R. in rabbits inseminated on days 2-4 after parturition, without using any stimulation on follicle growth. Several authors have also described the inhibitory effect of lactation on ovulation. According to Lin, K.C. et al. (1987), Yoshimura, Y. et al. (1990), and Morioka, N. et al. (1988) hyperprolactinemia has a direct effect on the ovary producing inhibition of the last stages of follicular maturation, follicular rupture and ovocyte maturation. A prolactin inhibition on the intrafollicular plasminogenic activator was also detected. Hamada, Y. et al. (1980), observed that the number of LH receptors in the follicular cells is influenced by prolactin secretion. PRL secretion could also be responsible for the low magnitude of LH and FSH response to GnRH seen in lactating rabbits wich exhibit low sexual receptivity (Rodríguez, J.M. et al., 1989).

Our results confirm those obtained by others authors showing higher C.R. in non lactating rabbits A.I. 21 days after a non fertile insemination. The C.R. in this last group was comparable to that of the nulliparous rabbits.

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