

INFLUENCE OF FERTILIZATION IN WHITE NEW ZEALAND RABBIT DOES UNTIL 48-TH HOUR POST WEANING ON SOME PRODUCTIVE PARAMETERS

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As a multifetal animal, the reproductive parameters are essential for the effectiveness of rabbit breeding, so they have to be permanently controlled. Increasing those parameters, we could raise the rabbit productivity.

According **Grigorov** (2005), the White New Zealand rabbit breed is used for rabbit meat production.

Most commonly, intensive and semi-intensive reproductive rhythm are used in professional rabbit farms. Usually, insemination of does is done until day 11 *post partum*. There is an antagonism between reproduction and lactation. To be overcome it, the specialists, which work in professional rabbit farms, use hormonal schemes. The European member prefers to use an environmental meat for consumption. To meet these requirements, many rabbit scientists worked on the problem of improving reproductive parameters without any exogenous substances. They have examined many environmental methods (light stimulation, dam-litter separation, flushing, change of cages etc.), usually borrowed by other species. Those methods were named biostimulations (**Theau-Clement et al.**, 2006).

In earlier our study, we established, that the mating of does until 48th hour post weaning increased total born, number and weight of born alive rabbits (**Velikov**, 2013).

Dimitrova et al. (2009) compared two schemes of hormonal stimulation. First scheme included application of PMSG and GnRH. In the second it was applied only GnRH. As a result in first case they obtained 28.57% fertility rate and in second – 62.50% fertility rate. White New Zealand does showed higher level of fertility then Californian does. Such a higher level of fertility was observed by **Dimitrova et al.** (2010).

In Bulgaria, the majority of rabbits are bred in small domestic rabbit farms (**Dimitrova et al.**, 2008). The does are mated some days post weaning of litter. Therefore, the aim of present paper was to examine the influence of weaning of litter on some of the productive and reproductive parameters in the next reproductive cycle.

MATERIAL AND METHODS

The experiment was conducted with 43 multiparous White New Zealand rabbit does (17 does in control group and 26 does in experimental group) from Experimental Rabbit Farm in the Institute of Animal Science - Kostinbrod.

The does with their litters and bucks were bred in individual cages. The cage size was 800/600/350 mm. The does were fed restrictively with commercial pellets for does. From mating to birth, the does were fed with 200 g, from birth to the day 16 *post partum* – 300 g, and from the day 17 *post partum* to the weaning of litters – 400 g pellets. The bucks were fed with 200 g commercial pellets for fattening. The rabbits were watered *ad libitum* through nipple drinkers. The litters were weaned between day 35 and day 40 *post partum*.

The does of experimental group were placed in the buck's cage between the 4th and 6th, the 22nd and 24th and between the 46th and 48th hour post litter weaning until they were mated. The does, which did not be mated until 48th hour, left the experiment. In the does of control group were placed in the buck's cage for mating at least 72 hours post litter weaning.

The following parameters were monitored: the number of rabbits in litter, litter weight, young rabbit weight and absolute and daily gains at 8, 16, 21 and 35 days.

The dates were processed statistically with MS Excel 2003.

RESULTS AND DISCUSSION

We undertook this study because, according to some authors, it is more appropriate fertilization take place until 48 hours after weaning (**Nicodemus et al.**, 2002; **Boiti et al.**, 2006; **Castellini**, 2007).

Litter parameters on the 8th day post partum. The average values of litter size on the day 8 *post partum* were 7.12±1.96 in control group and 8.77±1.11 in ex-

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perimental group. In terms of average litter weight, values of this parameter were 1061.29 ± 242.14 g in control group and 1166.23 ± 244.65 g in experimental group. Average young rabbit weight in control group was 152.32 ± 21.37 g, and in experimental group 133.06 ± 20.39 g. As regard absolute and daily gains, lower mean values were observed in experimental group (respectively 74.66 ± 17.12 g and 9.33 ± 2.14 g) than control one (86.33 ± 15.04 g and 10.97 ± 1.88 g). The earlier fertilization (until 48th hour post weaning) increased the number of rabbits in litter and decreased both individual weight and daily gain at statistically significant difference between the mean values (Table 1).

Litter parameters on the 16th day post partum.

The average value of litter size on the day 16 post partum in control group was 7.06 ± 1.95 , and in experimental group – 8.04 ± 1.22 . The litter weight in control group was 1903.29 ± 444.09 g, and in experimental group –

1758.35 ± 320.44 g. The differences between previous values were not statistical significant, so the examined method did not influence on these parameters. As regard the individual weight, it was 219.46 ± 29.19 g in experimental group and 276.22 ± 44.23 g in control one. The mean values of gain parameters in control group were 123.99 ± 33.76 g and 15.49 ± 4.22 g, respectively for absolute gain and average daily gain. In experimental group, the values of the same parameters were respectively 86.40 ± 20.16 g and 10.80 ± 2.52 g. The earlier fertilization decreased the values of individual weight, absolute gain and average daily gain statistically significant ($P < 0.001$, Table 2).

Litter parameters on the 21st day post partum.

The mean values of litter size on the day 21 post partum were 7.06 ± 1.95 rabbits in control group and 7.96 ± 1.28 rabbits in experimental group. The difference was statistical significant ($P < 0.05$). Statistical

Table 1. Litter parameters in birth and on day 8th post partum ($x \pm SD$)

Parameter	Control group	Experimental group	P
Average values of litter size in birth, number	7.82 ± 2.21	9.65 ± 1.02	
Average litter weight in birth, g	497.18 ± 104.92	561.92 ± 97.35	
Average newborn rabbit weight, g	65.99 ± 13.60	58.40 ± 9.58	
Average values of litter size on the day 8 post partum	7.12 ± 1.96	8.77 ± 1.11	**
Average litter weight on the day 8 post partum, g	1061.29 ± 242.14	1166.23 ± 244.65	NS
Average young rabbit weight on the day 8 post partum, g	152.32 ± 21.37	133.06 ± 20.39	**
Absolute gain from birth to day 8 post partum, g	86.33 ± 15.04	74.66 ± 17.12	*
Average daily gain of young rabbit from birth to day 8 post partum.	10.97 ± 1.88	9.33 ± 2.14	*

***- $P < 0.001$; ** - $P < 0.01$; * - $P < 0.05$; NS-non significant ($P > 0.05$)

Table 2. Litter parameters on the 16th day post partum ($x \pm SD$)

Parameter	Control group	Experimental group	P
Average values of litter size on the 16 day post partum, g	7.06 ± 1.95	8.04 ± 1.22	NS
Average litter weight on the day 16 post partum, g	1903.29 ± 444.09	1758.35 ± 320.44	NS
Average young rabbit weight on the day 16 post partum, g	276.22 ± 44.23	219.46 ± 29.19	***
Absolute gain from day 8 to day 16 post partum, g	123.99 ± 33.76	86.40 ± 20.16	***
Average daily gain of young rabbit from day 8 to day 16 post partum.	15.49 ± 4.22	10.80 ± 2.52	***

***- $P < 0.001$; ** - $P < 0.01$; * - $P < 0.05$; NS-non significant ($P > 0.05$)

Table 3. Litter parameters on the 21st day *post partum* ($x \pm SD$)

Parameter	Control group	Experimental group	<i>P</i>
Average values of litter size on the 21 st day <i>post partum</i>	7.06±1.95	7.96±1.28	*
Average litter weight on the day 21 <i>post partum</i> , g	2352.59±558.53	2453.58±596.14	NS
Average young rabbit weight on the day 21 <i>post partum</i> , g	355.30±75.64	308.43±60.58	*
Absolute gain from day 16 to day 21 <i>post partum</i> , g	79.08±33.64	88.97±42.88	NS
Average daily gain of young rabbit from day 16 to day 21 <i>post partum</i> .	15.82±7.33	17.79±8.58	NS

***- $P < 0.001$; ** - $P < 0.01$; * - $P < 0.05$; NS-non significant ($P > 0.05$)

Table 4. Litter parameters on the 35th day *post partum* ($x \pm SD$)

Parameter	Control group	Experimental group	<i>P</i>
Average values of litter size on the 35 th day <i>post partum</i>	7.00±1.79	7.72±1.49	NS
Average litter weight on the day 35 th <i>post partum</i> , g	5729.19±1156.35	5631.24±1317.94	NS
Average young rabbit weight on the day 35 th <i>post partum</i> , g	836.96±112.57	733.72±117.66	**
Absolute gain from day 21 th to day 35 th <i>post partum</i> , g	473.80±61.71	420.70±69.41	*
Average daily gain of young rabbit from day 21 st to day 35 th <i>post partum</i> .	33.84±4.41	30.05±4.96	*

***- $P < 0.001$; ** - $P < 0.01$; * - $P < 0.05$; NS-non significant ($P > 0.05$)

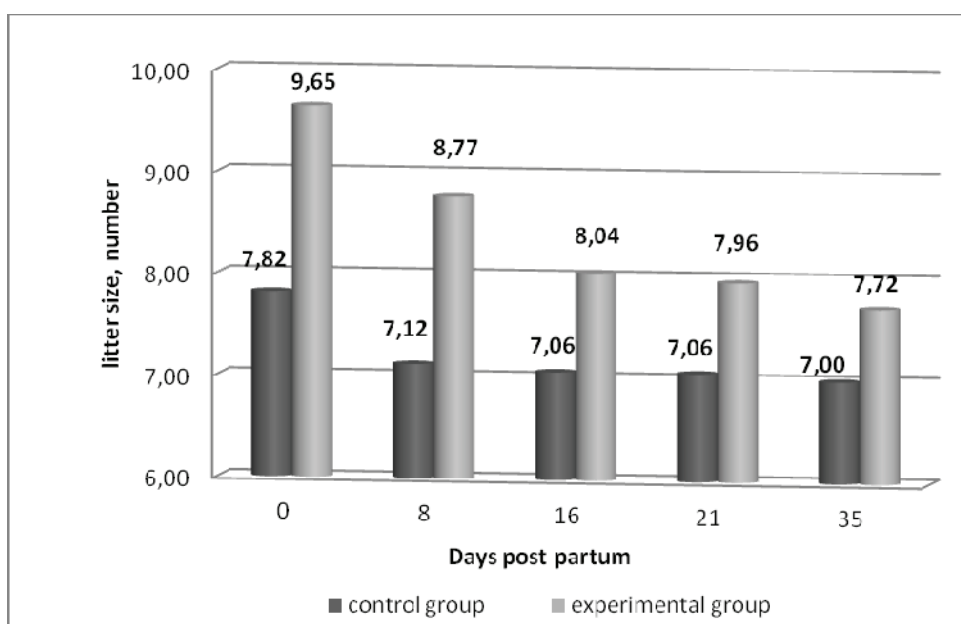


Fig. 1. Values of litter size in birth and on the day 8, 16, 21 and 35 *post partum*

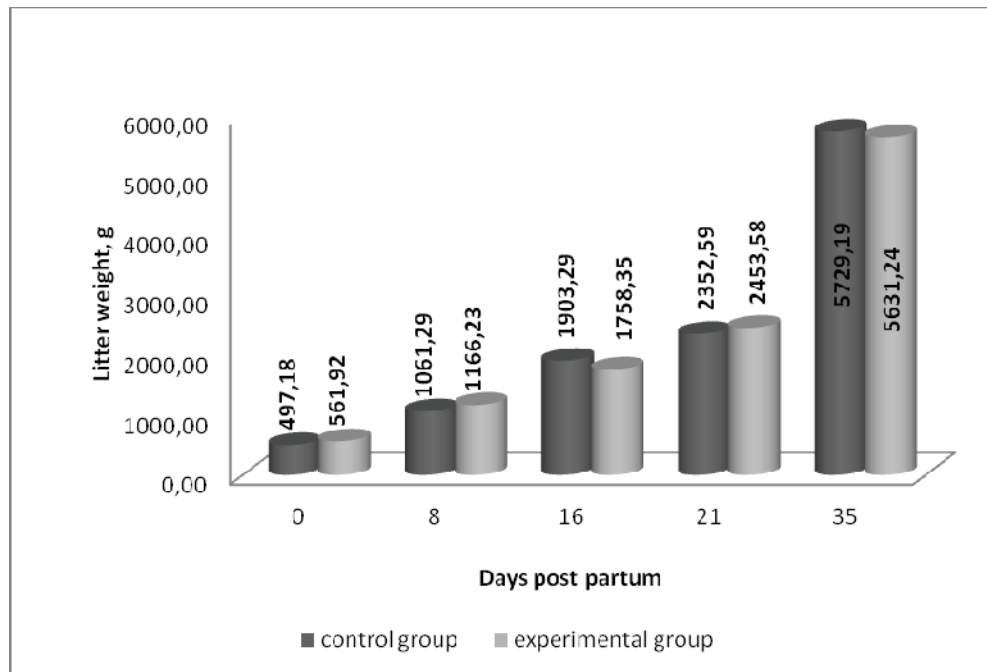


Fig. 2. Values of litter weight in birth and on the day 8, 16, 21 and 35 *post partum*

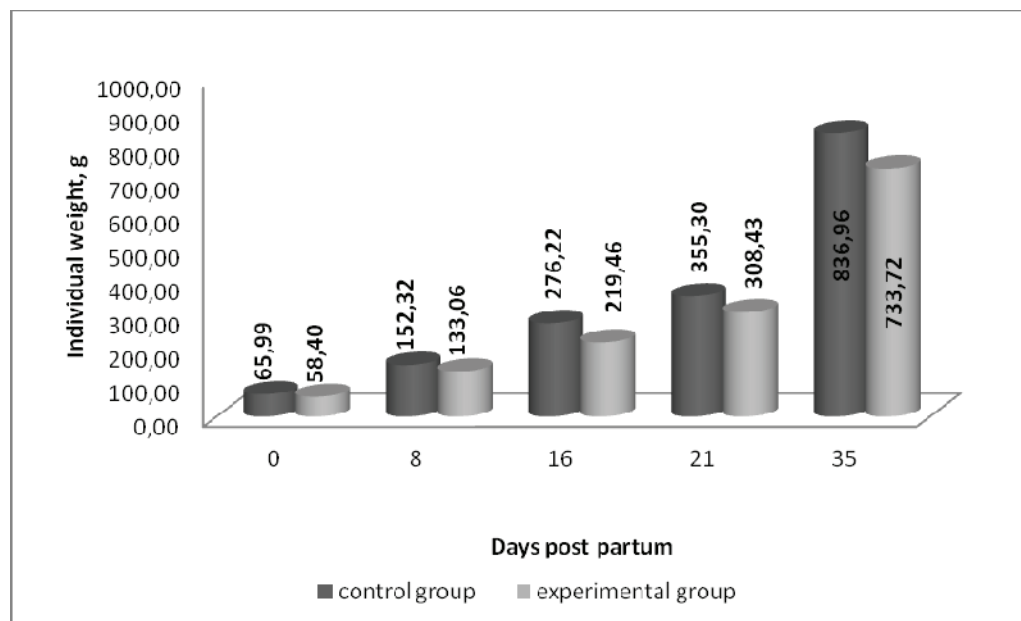


Fig. 3. Values of individual rabbit weight in birth and on the day 8, 16, 21 and 35 *post partum*

significant was the difference in individual weight of rabbits, too ($P < 0.05$). The value of this parameter in control group was 355.30 ± 75.64 g, and in experimental group – 308.43 ± 60.58 g. Mean litter weight in control group was 2352.59 ± 558.53 g, and in experimental group – 2453.58 ± 596.14 g. The values of gain parameters in control group were lower than these of experimental group, but the differences between means

were non significant. In control group, they were 79.08 ± 33.64 g and 15.82 ± 7.33 g, and in experimental group – 88.97 ± 42.88 g and 17.79 ± 8.58 g, respectively for absolute and average daily gain (Table 3).

Litter parameters on the 35th day *post partum*. The average values of litter size in experimental group was equal to 7.72 ± 1.49 rabbits, and in control group – 7.00 ± 1.79 rabbits. Mean litter weight on the day 35

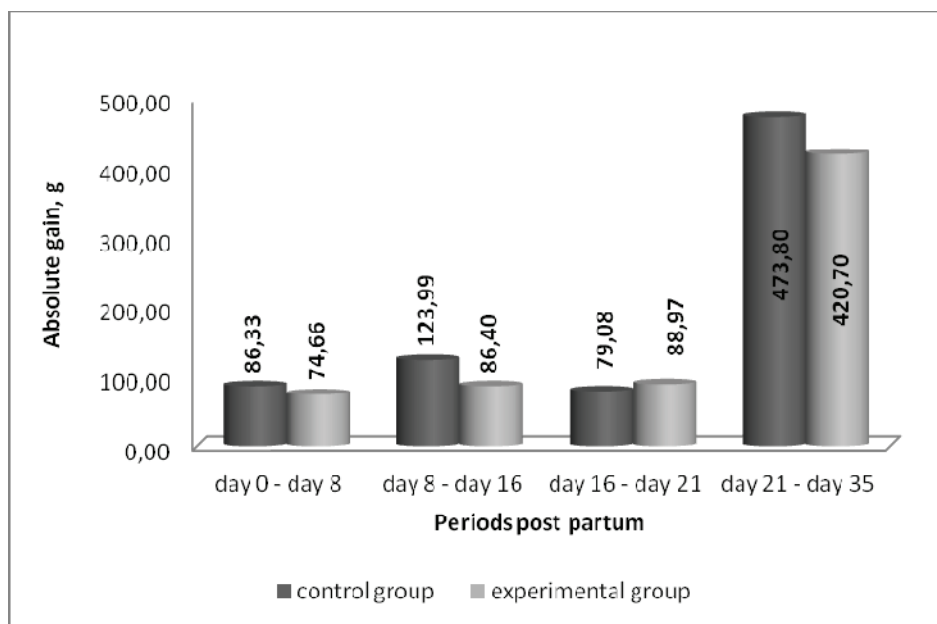


Fig. 4. Values of absolute gain in periods of the days 0-8, 8-16, 16-21 and 21-35 *post partum*

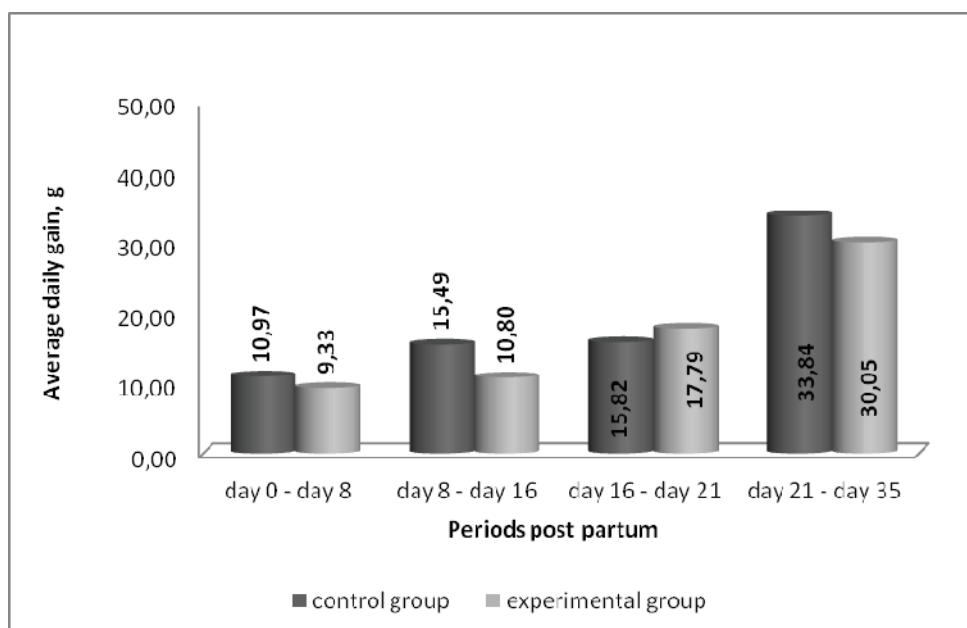


Fig. 5. Values of average daily gain in periods of the days 0-8, 8-16, 16-21 and 21-35 *post partum*

post partum was respectively 5631.24 ± 1317.94 g and 5729.19 ± 1156.35 g. The investigated method did not influence on these parameters, because the differences were not statistical significant.

The individual weight of rabbits on the day 35 *post partum* in experimental group was 733.72 ± 117.66 g, and in control group – 836.96 ± 112.57 g. The gain parameters in experimental group were lower than control one. The absolute gain in the period between day

21 and day 35 *post partum* was 420.70 ± 69.41 g and 473.80 ± 61.71 g, respectively for experimental and control group. In terms of average daily gain, the value in control group was 33.84 ± 4.41 g, and in experimental group – 30.05 ± 4.96 . The differences between means of individual weight and gain parameters were statistical significant, so the earlier fertilization of rabbit does decreased these parameters.

CONCLUSION

The fertilization of White New Zealand rabbit does until 48th hour post weaning increased only the values of litter size. In other parameters, we observed a decreasing in comparison of control group.

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The aim of present research was to be determinated the influence of fertilization until 48-th hour post weaning on some productive parameters of litter, namely litter size, weight of litter in birth, and on the 8th, 16th, 21st and 35th day post partum. The experiment was conducted with 43 White New Zealand rabbit does from experimental rabbit farm of Institute of animal science Kostinbrod. The average weight of young rabbits, their absolute and average daily gain are set. Obtained results suggested that, experimental group demonstrated lower values than control one, except the litter size.

Key words: *rabbit, New Zealand breed, fertilization, litter size, weight and daily gain of young rabbits*

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