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EFFECT OF GNRH INJECTION ON REPRODUCTIVE PERFORMANCE OF NEW ZEALAND WHITE DOE RABBITS

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ABSTRACT

The present study was undertaken to investigate the effects of GnRH injection on reproductive performance of NZW rabbit does. The experimental work was conducted at International Livestock Management Training Center (ILMTC), Sakha, Animal Production Research Institute, Kafr El-Shiekh Govermorate, in co-operation with Poultry Production Depatment in the Rabbit Research Unit; Agricultural Researches and Experiments Station; Faculty of Agriculture, Mansoura University, Egypt. A total of 48 rabbit does of body weights ranging from 2.75 to 3.5 kg were equally divided into three groups of 16 doe each. They were further subdivided into two sub-groups. The 1st sub-group (8 does) was intramuscularly injected with 2.5 mL saline solution post-kindling and served as a control, and the second half (8 does) was intramuscularly injected after kindling (0 day) with 2.5 mL of GnRH analogue per doe (Receptal, Intervet equivalent B.V. Boxmeer-Holland, each ml of Receptal contained 0.0042 mg Buserelin acetate equivalent to 0.004 mg Buserelin) (G1). The same injection procedures and tested dose (2.5 mL/doe) of GnRH were applied on the second and third experimental sub-groups of rabbit does at 5 and 10 days post-kindling (G2 and G3), respectively. After parturition, conception rate and the size of the litter (total and live borns at birth), were recorded. Plasma concentrations of progesterone was determined at 0,7,14,21,28 day after kindling.

The obtained results could be summarized as follows:

Injection of GnRH improved fertility of rabbit does in term of litter size and overcome other treatments. Since the GnRH-treated group (3) had the highest litter size at birth (8.2) followed by G1 (5.00) then G2 (1.8) youngs.

Litter size at birth was significantly improved by either saline or GnRH injection at day of kindling (day 0) or day 10 post-kindling. The values obtained for litter size were (4.00 and 5.88 *vs.* 1.63), for live bunnies (3.25 and 5.13 *vs.* 1.38) and for viability rate of bunnies at birth (61.25 and 65.35 *vs.* 31.25%), for G1 and G3 compared with the G2, respectively. The overall mean of viability rate at birth was 66.3%,32.1%,72.5% in treatments groups (G1,G2 and G3), respectively. There were significant difference between treatments on the means of viability rate of youngs at birth, which were 71.3, 32.9,79.6% and 61.2, 31.2, 65.3% for control, G1, G2 and G3 groups, respectively.

It was observed that hormonal treatment of does in G1 and G3 improved conception rate from 75% to 87.5% compared with 37.5% for G2. The differences between saline-injected (control) and GnRH injected groups were not significant, however, the time of injection has the greatest influence on conception rate. In this respect the present results showed that GnRH and control injection at 5 days post-kindling gave the lowest conception rate.

Means of plasma progesterone concentration of rabbit does at 0;7;14;21 and 28 days of pregnancy in the control and treated does was not significantly affected. It is concluded that GnRH injection at day of kindling or 10 days post-kindling maybe used as a tool for improving the reproductive traits of NZW rabbit does.

Keywords: GnRH, does rabbits, reproductive performance, progesterone.

INTRODUCTION

For many hundred of years the rabbit has been domesticated and rabbit keeping is practised for various reasons in most parts of the world. Althought the rabbit has been domesticated for many centuries, it is only in the last one hundred and fifty years that breeders have devoted their time and energy to breeding superior animals (Sanford, 1986).

In general, ovulation and fertilization rates in rabbits are the most important traits which affect directly the viability of their youngs and litter size at birth (Hafez, 1980).

In rabbits, ovulation is a neuroendocrine reflex that is physiologically induced at the condition of natural breeding. The mechanisms whereby rabbit does become spontaneous ovulators are still unclear, but are likely associated to factors interfering with the control of the gonadal axis involving the hypothalamic centers responsible for GnRH release (Rauw *et al*., 1998). Ovulation failure is probably the most important single cause of infertility in the rabbit (Adams, 1976).

Therefore, the objective of this study was to evaluate the *in vivo* reproductive performance response of New Zealand White (NZW) rabbit does injected with 2.5 ml GnRH/doe before mating.

MATERIALS AND METHODS

The experimental work was conducted at International Livestock Management Training Center (ILMTC), Sakha, Animal Production Research Institute, Kafr El-Shiekh Govermorate, in co-operation with Poultry Production Depatment in the Rabbit Research Unit; Agricultural Researches and Experiments Station; Faculty of Agriculture, Mansoura University, Egypt.

The main objective of the study was to evaluate the effect of GnRH injection at either 0,5 or 10 days post parturation on reproductive performance of NZW rabbit does and growth performance of their kits.

Experimental Animals, housing, nutrition and their management:

Total of 48 mature New Zealand White (NZW) rabbit does were used in the present study. Does weight ranged between 2.75 to 3.500 kg and the average age was about 8-12 months. As well as 8 fertile NZW rabbit bucks were used for natural mating with live body weight ranged between 3.00 to 4.50 kg and about 12 months of age. All animals were healthy and clinically free of the common external and internal parasites.

Pregnant or lactating does were fed *ad libitum* whereas non-lactating does were restricted to 150 g/day. All does, for practical reasons; including non lactating females, were fed with their kits a suitable commercial diet. Composition and calculated analysis of the experimental diet are shown in

Table (1):

Ingredients	Dietary levels (%)
Yellow corn	5
Barley	10
Alfa alfa meal	35
Wheat bran	35
Soybean meal (44% CP)	10
Limestone	1.28
Common salt	0.3
Molasses	3
Vit. & min. premix	0.3
Meth; %	0.11
Lys; %	0.02
Total	100
Calculated analysis (air dry basis, NRC, 1994)	
ME; kcal/kg	2500-2600
CP; %	16.5
CF; %	13-14

Water was provided *ad libitum* all over the experimental period. Normal vaccination programs were done while multivitamins and some antibiotics were used as a prophylactic measure.

The minimum and maximum ambient air temperatures during the whole experimental period were adjusted to be ranged between 18° C to 24° C by using air conditioner. The minimum and maximum relative humidity ranged between 40% and 55%.

Does and bucks were kept under the same management system. All does were individually housed in flat deck cages (50×60×40cm) communicated through a circular hole with external nests (50×30×30 cm), which could be closed by a sliding door for kindling and nursing. Cages were equipped with feeding hopers made of galvanized steel and have nipples for automatic drinking water to dispensers and only for does with internal nest boxes. Cages and nest boxes were cleaned and disinfected regularly before each kindling. Urine and feces dropped from the cages on the floor were cleaned every day in the morning.

Does were mated naturally with proven fertile bucks. Pregnancy was diagnosed by abdominal palpation at day 12 post service. Productive and reproductive performance of female rabbits was studied through two consecutive parities.

Experimental design:

Experiment 1 (Parity I):

During parity one, 48 rabbit does of body weights ranging from 2.75 to 3.5 kg were equally divided into three groups. Each experimental group was subdivided into two haves. One half of the 1st group (8 does) was intramuscularly injected with 2.5 mL saline solution post-kindling and served as a control, and the second half (8 does) was intramuscularly injected after

kindling (0 day) with 2.5 mL of GnRH analogue per doe (Receptal, Intervet equivalent B.V. Boxmeer-Holland, each ml of Receptal contained 0.0042 mg Buserelin acetate equivalent to 0.004 mg Buserelin) (G1).

The same injection procedures and tested dose (2.5 mL/doe) of GnRH were applied on the second and third experimental sub-groups of rabbit does at 5 and 10 days post-kindling (G2 and G3), respectively. Just after injection with saline or GnRH all rabbit does were allowed to natural mating by fertile rabbit bucks.

Productive and reproductive performance management:

On day of mating, all does were intramuscularly injected with 2.5 mL GnRH analogue (Receptal, Intervit, International, B.V. Boxmeer, Holland) to induce superoulation. Each doe was palpated 12 days thereafter to diagnose pregnancy and those failed to conceive were returned to remate. On day 27 of mating, the nest boxes were supplied with wooden straw to help the doe in preparing a worm comfortable nest for the kits of her litter. After parturition, conception rate, gestation period length (days) and the size of the litter (total and live borns at birth), were recorded.

The overall mean of gestation period in the present study was 31.2 days. This mean is in line with those estimated by Afifi and Emara (1985), Amina (1988) and El-Bogdady *et al.* (1992), their estimation were 31.9, 31.7, 31.3 and 31.1 days, respectively. Radwan (1986) reported a shorter period (30.2 days).

Blood samples and hormonal assay:

Blood samples were taken from six does in each group at 0,7,14,21,28 day after mating. Blood samples were collected by puncture from the margin ear vein in heparinized clean test tubes and immediately centrifuged (4000 g) for 15 min. Then, plasma was separated and stored at -20 ℃ until assay. Plasma concentrations of progesterone was determined in duplicate samples.

Data recorded:

Data were collected for each treatment group including litter traits, kindling rate, litter size, number live and dead bunnies per litter.

Dead kits were removed and then size of live bunnies were recorded after birth. The viability rate was calculated as the number of live kits per total number of borns×100. Also, length of gestation period (day) and conception rate were calculated.

Statistical analysis:

Data obtained were subjected to analysis of variance by using computer program of software package (SAS, 2004). Also, the effect of treatment and their interaction only for the 1^{st} parity on concentration of progesterone in blood plasma were performed.

The significant differences among means were set at $p<0.05$ using Duncan's Multiple Range Test, Duncan (1955). The percentage values were subjected to arcsine transformation before performing the analysis of variance. Means were presented after being recalculated from the transformed values to percentages.

RESULTS AND DISCUSSION

***In vivo* study:**

Reproductive performance:

Litter size at birth:

Means of litter size at birth as affected by treatment are hown in Table (2).

Overall means of litter size was 4.5 youngs per doe regardless GnRH treatment (Table 2). The present results showed low number of kits than those reported by Torjan and Mach (1980), who found 6.65 youngs per doe for California breed, while Abdel-Glil (1993) reported a general mean of litter size at birth of 5.86 youngs for different rabbit breeds. In contrast McNitt and Lukefahr (1990) obtained a higher mean litter size at birth of 7.3 youngs for California does. The present results may be due breed differences, where NZW does were used in our study

These results are in close agreement with those reported by Korany (1980), Mach and Torjan (1981), Soliman (1983) and Abdel- Glil (1993), who found insignificant differences in litter size between breeds. However, Hafez (1970) reported that average litter size at birth ranged from 4 to 8-10 youngs depending on the breed. Rouvier *et al.* (1973), Campos *et al.* (1980), Partridage *et al.* (1981) and Lukefahr *et al.* (1983a) reported significant difference between California and New Zealand White breeds in litter size at birth. Balat *et al.* (1990) reported 6.43, 5.33, 7.80 and 4.75 youngs per doe for Flander, California, Bouscat and Rex breeds, respectively. They found significant difference between the first breed and Rex only. In close agreement with present study, McNitt and Lukefahr (1990) observed insignificant differences between California, New Zealand White, Polomino and White strains in the means of litter size at birth, which were 7.26, 6.49, 6.69 and 5.95 youngs for the corresponding breeds, respectively. Such differences between studies may be due to strain effect and breed by environment interaction or something else (*i.e.* managerial condition).

Regardless of breed, the results of the present study showed that GnRH improved fertility of doe rabbits in term of litter size and overcome other treatments. It was observed that GnRH treatment groups has increased litter size compared with control, respectively.

Since the GnRH-treated G-3 NZW does had the highest litter size at birth (8.25 youngs), compared with those of G-1 and G-2 (5 and 1.88), respectively.

Generally, it can be seen from the present study that GnRH injection at day 10 post-kindling improved litter size at birth compared with the other injection times (0 and 5 days post-kindling).

It was also observed in the present study that GnRH treatment improved fertilization rate in term of litter size at birth.

These results are in close agreement with other previous results, which reported that treated doe rabbits with GnRH improved fertilization rate (Aref

et al., 1973; Hawk *et al.*, 1982; El-Menoufy *et al.*, 1984 and Rodriguez *et al.*, 1989).

There were several studies dealing with the role of GnRH injection at the time of mating and its effect on fertility and in turn litter size at birth. They postulated that GnRH may cause constrictions of vulvo-vaginal junction or exert changes in the contractility of reproductive tract that resulted in reducing the loss of sperms in the uterine horns and increase the fertilization rate due to increased in the number of sperm in the uterus and oviduct (Morton and Glover, 1974 and Hawk and Cooper, 1979) or due to increased uterine motility and improves the ovum fertilization rate (Hawk *et al.*, 1982).

Data presented in Table (2) show that the saline-injected group of does in G1 and G3 have improved litter size at birth compared with those of G2 (4.00 and 5.88 *vs.* 1.63, $P<0.05$), also the number of live bunnies (3.25 and 5.13 *vs.* 1.38, $P<0.05$) and the viability rate of at birth was 61.25 and 65.35 *vs.* 31.25% for G1,G3 and G2, respectively.

Vicente *et al*. (2008) reported that intra-vaginal GnRH administration on commercial farms and the genetic strain affected the kindling rate, which was reduced by 7.4% in comparison with intra-muscular GnRH administration.

Viability rate:

Means of viability rates for youngs during 1st day of delivery as affected by different treatments are shown in Table (2).

The overall mean of viability rate at birth was 66.3%,32.1%,72.5% in treatments groups G1,G2 and G3, respectively. It was lower than those found by Radwan (1986), (89.3%), Amina (1988), (95.1%) and Abd El-Glil (1993), (94.1%).

These results are in close agreement with the reports of El-Maghawry *et al.* (1988); El-Maghawry (1990), Oudah (1990), Sedki (1991), Tawfeek and El-Hindawy (1991), El-Bogdady *et al.* (1992) and Abd El-Glil (1993) they reported different viability rates depending on breed, age and treatments.

On the other hand, in contrast to the present results, Campos *et al.* (1980), Partridage *et al.* (1981) and Lukefahr *et al.* (1983a) reported that doe genetic group affected significantly the percentage of early survival of litters (Percentage of youngs born alive of total number born).

It can be seen from Table (2) that the time of injection has a significant effect on the means of viability rate of youngs at birth, which were 71.3, 32.9,79.6% for GnRH treatments and 61.2, 31.2, 65.3% for control at day-0; day-5 and day-10 post-kindling, respectively.

It is clear from these results that does which have a larger size at birth had a higher mortality rate of youngs at birth day. These results agree with those found by Wanis (1958), Partridge *et al.* (1984) and Radwan (1986), who found that increasing litter size at birth increased mortality rate at birth.

Some other values were found by Abdel-Rahim *et al.* (1995), being 74% and 93.41% was found by El-Kelawy and Aboulnaga (1995).

Table (2): Means of reproductive performance for NZW does as affected by different treatments of GnRH.

Groups	Item	Control (n=8)	GnRH (n=8)	Overall mean
G1 day (0)	LBW/doe (kg)	2.773±0.043	2.725±0.043	2.749±0.031
	Litter size (n)	4.000±1.068^{b}	5.000±1.068^{b}	4.500±0.755
	Live born (n)	3.250±0.947^{b}	4.750±0.947^{b}	4.000±0.669
	Viability (%)	61.250±14.669^{b}	71.354±14.66^{b}	66.302±10.430
G2 day (5)	LBW/doe (kg)	2.719±0.043	2.740±0.043	2.729±0.031
	Litter size (n)	1.625±1.068^{c}	1.875±1.068^{c}	1.750±0.755
	Live born (n)	1.375±0.947^{c}	1.625±0.947^{c}	1.500±0.669
	Viability (%)	31.250±14.669^{c}	32.917±14.66^{c}	32.083±10.430
G3 day (10)	LBW/doe (kg)	2.675±0.043	2.841±0.043	2.758±0.031
	Litter size (n)	5.875±1.068^{a}	8.250±1.068^{a}	7.062±0.755
	Live born (n)	5.125±0.947^{a}	7.250±0.947^{a}	6.187±0.669
	Viability (%)	65.352±14.669^{a}	79.610±14.66^{a}	72.480±10.430

a,b,c Means within columns or rows with different superscripts are significantly different (P≤0.05).

Gestation period:

Means of gestation period as affected by breed and GnRH are 31 day.

The overall mean of gestation period in the present study was 31.2 days. This mean is in line with those estimated by Afifi and Emara (1985), Amina (1988) and El-Bogdady *et al.* (1992), their estimation were 31.9, 31.7, 31.3 and 31.1 days, respectively. Radwan (1986) reported a shorter period (30.2 days).

These results are in close agreement with those of Sedki (1991), El-Bogdady *et al.* (1992) and El-Sayiad *et al.* (1993), but contrary to that reported by Radwan (1986) and Oudah (1990). Templeton (1968) noted that 85.5% of New Zealand White kids were born on day 31 and 32 of pregnancy and no normal litters were born before 29 days. There are many factors, which may influence the gestation length, for example the season of the year, the size of the does and the size of litter (Sandford, 1979).

Data presented in Table (3) show that hormonal treatment of does in G1 and G3 improved conception rate from 75% to 87.5% compared with 37.5% for G2. The differences between saline-injected (control) and GnRH injected groups were not significant, however, the time of injection has the greatest influence on conception rate. In this respect the present results showed that GnRH and control injection at 5 days post-kindling gave the lowest conception rate.

However, Zapletal and Pavlik (2008) reported that the conception rates ranged from 10.0% to 89.5% for different GnRH doses.

Table (3): Means of conception rate (%) for NZW does as affected by the time of GnRH injection.

Groups	Conception rate (%)		Overall mean
	Control (n=8)	GnRH (n=8)	
G1	75.000±16.480[a]	75.000±16.480[a]	75.000±11.653
G2	37.500±16.480[b]	37.500±16.480[b]	37.500±11.653
G3	75.000±16.480[a]	87.500±16.480[a]	81.250±11.653
Overall mean	62.500±9.515	66.667±9.515	64.583±6.728

[a,b] **Means within columns or rows with different superscripts are significantly different (P≤0.05).**

Plasma progesterone concentration:

Means of progesterone concentration in peripheral plasma for non pregnant does before injection, and at 0,7,14,21 and 28 days during pregnancy in control and treated does as affected by treatments are shown in Table (4) and illustrated in Figure (1).

This value was similar to those estimated by other workers who reported average values of 0.25-0.46 ng/ml in New Zealand White rabbits (Amina, 1988), 0.4 ng/ml in New Zealand White rabbits (Habbeb and El-Masry, 1991), and 0.35-0 45 ng/ml (Lamb *et al.*, 1 991 and Ashour *et al.*, 1 995).

The present study showed that plasma progesterone concentrations increased rapidly within the first two weeks of pregnancy. The overall means were (6.733 and 12.467) ng/ml at 7 and 14 days of pregnancy in G1, (12.333 and 17.550) in G2 and at least, (17.067 and 20.417) are shown in (Table 4 and Figure 1). These results are in close agreement with those reported by Harrington and Rothermel (1977); Amina (1988); Habbeb and El-Masry (1991); Lamb *et al.* (1991); Abdel-Glil (1993) and Ashour *et al.* (1995), who found that plasma progesterone concentrations rose rapidly during the first half of pregnancy and began to decline from day 18 (Harrington and Rothermel, 1977 and Amina, 1988), since progesterone is required for maintenance of pregnaney before and after implantation and the ovary is the main source of progesterone in pregnant rabbits (Hafez, 1980).

On the other hand, the present results showed that GnRH treated-does has the highest plasma progesterone concentrations were (15.833 and 22.267) ng/ml for GnRH groups (G1,G2 and G3) at periods of 7 and 14 days during pregnancy, followed by GnRH group (12.700 and 17.600 ng/ml) then (9.767 and 14.700) at the same periods, respectively. While the control group attained the lowest plasma progesterone concentration were (3.700 and 10.233) ng/ml in G1, (11.967 and 17.500) in G2 and the highest plasma progesterone concentration were (18.300 and 18.567) are shown in Table (4) and illustrated in Figure (1) at periods of 7 and 14 days of pregnancy, respectively. The higher levels which were found in treated does could be attributed mainly to the effect of different treatments in improving fertilization rate as mentioned before.

All the previous role of GnRH resulted in improved fertility and hence, increased ovarian response and ovulation rate, and finally increased the numbers of corpora lutea, which increased plasma progesterone concentration in treated rabbits than untreated as illustrated before.

Table (4): Means of progesterone (ng/ml) at different days for NZW does as affected by different treatments of GnRH.

Groups	Time (day)	Progesterone (ng/ml)		Overall mean
		Control (n=3)	GnRH (n=3)	
G1 (n=6)	0	0.057±0.971	0.620±0.971	0.338±0.687
	7	3.700±0.971	9.767±0.971	6.733±0.687
	14	10.233±0.971	14.700±0.971	12.467±0.687
	21	6.267±0.971	10.933±0.971	8.600±0.687
	28	2.567±0.971	7.233±0.971	4.900±0.687
Overall mean (n=6)		4.565±0.434	8.651±0.434	6.608±0.307
G2 (n=6)	0	0.633±0.971	1.333±0.971	0.983±0.687
	7	11.967±0.971	12.700±0.971	12.333±0.687
	14	17.500±0.971	17.600±0.971	17.550±0.687
	21	13.933±0.971	13.833±0.971	13.883±0.687
	28	8.533±0.971	9.833±0.971	9.183±0.687
Overall mean (n=6)		10.513±0.434	11.060±0.434	10.787±0.307
G3 (n=6)	0	1.333±0.971	1.533±0.971	1.433±0.687
	7	18.300±0.971	15.833±0.971	17.067±0.687
	14	18.567±0.971	22.267±0.971	20.417±0.687
	21	15.600±0.971	18.067±0.971	16.833±0.687
	28	10.500±0.971	12.733±0.971	11.617±0.687
Overall mean (n=6)		12.860±0.434	14.087±0.434	13.473±0.307

All differences among groups are not significant at P>0.05.

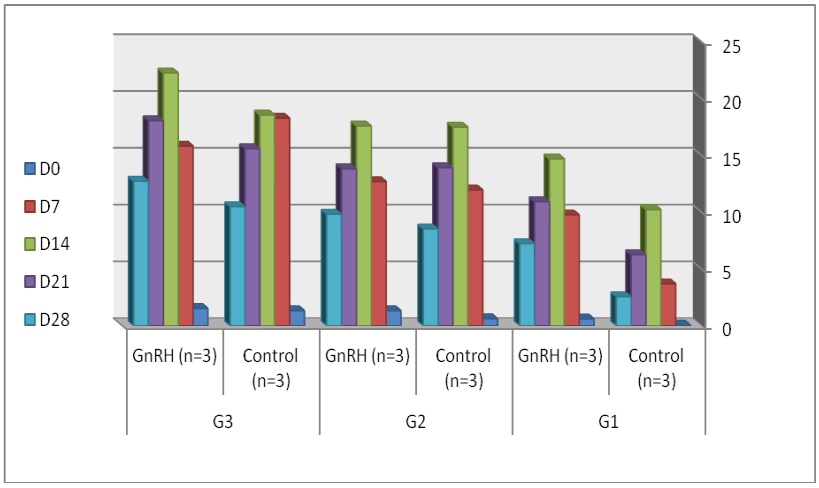

Fig. (1): Means of progesterone (ng/ml) at different days for NZW does as affected by different treatments of GnRH.

CONCLUSION

Based on the foregoing results, stimulation of ovulation in rabbit does by 2.5 mL GnRH (receptal)/doe at day of kindling or at 10 days post-kindling can be successfully used to improve fertility of rabbits and increase their litter size. Also, further studies are necessary for determining an optimal level of GnRH analogue at different times of mating in relation to the physiological status of rabbit does at the moment of mating.

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تأثير حقن الهرمون المنشط للغدد الجنسية على الأداء التناسلى لأمهات الأرانب النيوزيلندي الأبيض

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أجريت هذه الدراسة لبحث تأثير حقن الهرمون المنشط للغدد الجنسية بمعدل ٢.٥ مل/أنثى قبل التلقيح وبعد الولادة مباشرة أ، بعد ٥ أو ١٠ أيام٠ تم إجراء التجربة البحثية في المركز الدولي للتدريب على رعاية الحيوان، بسخا، معهد بحوث الإنتاج الحيواني، محافظة كفر الشيخ، بالتعاون مع قسم إنتاج الدواجن؛ بمحطة الأبحاث والتجارب الزراعية. كلية الزراعة، جامعة المنصورة، مصر. وقد أستخدم في هذه الدراسة ٤٨ أرنب (أنثي) يتراوح وزن الجسم مابين ٢.٧٥ إلى ٣.٥ كجم بالتساوي وقسمت إلي ثلاث مجموعات، وقد تم تقسيم كل مجموعة تجريبية إلى قسمين كل قسم يحتوي علي ٨ أمهات. المجموعة التجريبية الأولى تم حقن أمهات القسم الأول (الكنترول) عضليا بمحلول ملحي ٢.٥ مل/أنثى، وبالنسبة لأمهات القسم الثاني (المعاملة) تم حقنها في العضل بالهرمون المنشط للغدد الجنسية (ريسبتال) بمعدل ٢.٥ مل/أنثى وذلك بعد الولادة مباشرة. طبقت نفس الإجراءات على المجموعات التجريبية الثانية والثالثة وذلك فى اليوم (٥) واليوم (١٠) بعد الولادة، على التوالي. بعد الولادة، تم أخذ القياسات التالية: نسبة الحمل (%)، وطول فترة الحمل (يوم)، وعدد الخلفات (الكلي والحي عند الميلاد)، وقد تم تسجيلها. كما أخذت عينات الدم من ٦ أمهات (٣ من الكنترول و٣ من المعاملة) من كل مجموعة تجريبية وذلك لتقدير هرمون البروجسترون في تركيزات البلازما وذلك في الأيام ٠،٧،١٤،٢١،٢٨خلال فترة الحمل.

وجاءت النتائج المتحصل عليها على النحو التالي: أنه تحت نفس ظروف التربية، أظهرت نتائج الدراسة أن إستخدام الهرمون المنشط للغدد الجنسية (ريسبتال) يعمل علي تحسين نسبة خصوبة الأرانب. كما لوحظ أن المجموعة الثالثة التى حقنت بالهرمون المنشط للغدد الجنسية سجلت أعلى عدد للخلفات عند الولادة بنسبة (٨.٢)، يليها المجموعات التجريبية الأولى (٥)، ثم المجموعة التجريبية الأولى (١.٨)، أما عدد الخلفات الحية (٣.٢٥ و ٥.١٣ مقابل ١.٣٨)، على التوالى.

أيضا وجد زيادة فى المعنوية بالنسبة لعدد الخلفات الكلي عند الولادة في المجموعة التجريبية الأولى (عند اليوم ٠ من الولادة) والمجموعة التجريبية الثالثة (عند اليوم ١٠ من الولادة) التى حقنت بمحلول ملحى (٣.٢٥ و ٥.١٣ مقابل ١.٣٨)، وعدد الخلفات الحية عند الولادة (٤.٠٠ و ٥.٨٨ مقابل ١.٦٣). أيضا توضح النتائج زيادة معنوية فى معدل الحيوية للخلفات فى المجموعات التى حقنت بالهرمون المنشط للغدد الجنسية (٧١.٣٥ و ٧٩.٦١ مقابل ٣٢.٩٢٪) عن المجموعات التجريبية التى حقنت بمحلول ملحي (٦١.٢٥ و ٦٥.٣٥ مقابل ٣١.٢٥٪). وبالرغم من ذلك، لم يتأثر طول فترة الحمل بحقن الهرمون، والتي كانت تتراوح ما بين ٣١.٠ و ٣١.٦٧ يوما، وكانت الإختلافات بين المجموعات التجريبية التى حقن بمحلول ملحي (الكنترول) والتى حقنت بالهرمون المنشط للغدد الجنسية غير معنوية، ولكن التأثير كان في ميعاد الحقن. وفي هذا الصدد أظهرت النتائج الحالية أن المجموعة الثانية التى حقنت عند اليوم ٥ بعد الولادة سجلت أدنى نسبة الحمل.

وقد أوضحت نتائج تركيز هرمون البروجسترون في البلازما خلال الأيام ٠،٧،١٤،٢١،٢٨ أثناء فترة الحمل أنه ليس هناك فروق معنوية بين أمهات (الكنترول) وأمهات (المعاملة) بالنسبة للمجموعات التجريبية الثلاثة.

ولقد خلصت نتائج الدراسة إلي أهمية إستخدام الهرمون المنشط للغدد الجنسية بعد الولادة مباشرة أو بعد مرور عشرة أيام وذلك لتحسين الأداء التناسلي لأمهات الأرانب النيوزيلاندي الأبيض.