



IMPROVING REPRODUCTIVE EFFICIENCY OF RABBIT DOES USING HORMONAL, NUTRITIONAL OR ACETIC INTRA-VAGINAL WASHING TREATMENTS

By

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SUMMARY AND CONCLUSION

The present study was carried out on 120 does V- line rabbit in rabbit unit, Faculty of Agriculture, Fayoum University. The period of experiment started in January, 2009 and lasted in July 2009.

The aim to this study improve reproductive efficiency of rabbit does using hormonal, nutritional or acetic acid intra-vaginal washing treatments. All V-line does rabbit used in the study have low reproductive performance which represented by a small litter size (less than 5 kits per litter at birth), low conception rate (less than 50%) and does refusal to be mated by males. The does were stratified by age (18 and 30 months). Does were allowed to kindle for two parities consecutively. Natural mating by fertile bucks was done. The study included three experiments: Prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$), acetic acid intra-vaginal washing or Selenium supplementation sources.

The study involved the following parameters of does and offspring: vulva color, sexual receptivity, conception rate, gestation period, litter size at birth (LSB), alive kit at birth (alive), litter size at 21 days of age (LS_{21}) litter size at weaning (LSW), litter weight at birth (LWB), litter weight at 21 days of age (LW_{21}), litter weight at weaning (LWW), mean kit weight at birth (MKWB), mean kit weight at 21 days of age (MKW_{21}), mean kit weight at weaning (MKWW), mortality rate of kits at birth (dead%), mortality rate of kits at 21 days of age ($MR_{21}\%$) and total pre-waning mortality% (TPWM%). Moreover, the following hematological parameters were studied: red blood cells count (RBC's), hemoglobin (Hg%), hematocrit (Ht%), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), white blood cells count (WBC's), white

blood cells differentials, platelets count and progesterone level. Additionally, live body weight (LBW), live body weight gain (LBWG), feed consumption (FC), feed conversion ratio (FCR), crude protein conversion (CPC), caloric conversion ratio (CCR), performance index (PI) and economical efficiency were evaluated. Age of doe, experimental order of parity and in some case physiological status of doe were considered.

Experiment 1:

A total number of 48 low reproductive V-line does rabbit were used and randomly allotted into three equal groups, 16 does of each. The first group acts as negative control and the second group were considered as positive control (each doe was injected intramuscularly with 1 ml saline solution, 0.9% NaCl), however, group 3 treated with cloprostenol prostaglandin synthetic analogue PGF_{2α} (each doe was injected intramuscularly with 0.25 ml estoPLAN). Does were mated naturally by fertile bucks 72 hrs post- injection.

Experiment 2:

A total number of 48 low reproductive V-line does rabbit were used and randomly allotted into three equal groups. The first group acts as negative control and the second group was considered as positive control (each doe was injected intra-vagina with 1 ml saline solution, 0.9% NaCl), however, group 3 treated with acetic acid (each doe was injected intra-vagina with acetic acid [1%] by used insulin syringe 100 unit without a needle). Does were mated naturally by fertile bucks directly post-treated.

Experiment 3:

A total number of 40 low reproduction V-line does rabbit were divided randomly into four equal groups (10 does each). The 1st group was fed the basal diet (Table 5) and served as control group

(unsupplemented with Se) while the 2nd, 3rd and 4th groups were fed on the same diet supplemented with two sources of Se, 2nd group was fed the basal diet supplemented with organic Se as Sel-Plex (150 g/ton diet) in the form of Se yeast as Sel-Plex (Alltech Inc.) contains 1000 mg Se/Kg Sel-Plex and produced by the fermentation of yeast (*Saccharomyces cerevisiae*) in a high Se medium, 3rd group was fed the basal diet supplemented with inorganic Se (Sodium Selenite, 0.36 g/ton diet) and 4th group was fed the basal diet supplemented with mixed between organic and inorganic selenium (75 g Sel-Plex /ton diet + 0.18 g sodium Selenite).

The obtained results can be summarized as follows:

Experiment (1).

1- PGF_{2α} injection effects were:

- a) Highly significant ($P \leq 0.001$) on vulva color – sexual receptivity – conception rate – LSB – LS₂₁ – LSW – alive – MKWB – LWB – LW₂₁ – LWW – RBCs count – MCV.
- b) Significant ($P \leq 0.01$) on gestation period – MKWW – WBCs count.
- c) Significant ($P \leq 0.05$) on dead%.

2- Age of doe effects were:

- a) Significant ($P \leq 0.01$) on LSB – alive.
- b) Significant ($P \leq 0.05$) on LS₂₁ – LSW – TPWM% – MKWB – MKWW.

3- Experimental order of parity effects were:

- a) Highly significant ($P \leq 0.001$) on MKWB – MKWW – RBCs count.
- b) Significant ($P \leq 0.01$) on MKW₂₁.
- c) Significant ($P \leq 0.05$) on platelet count.

4- Physiological status effects were:

- a) Highly significant ($P \leq 0.001$) on platelet count- WBCs count - Neutrophils/ Lymphocytes - progesterone level.
- b) Significant ($P \leq 0.05$) on RBCs count – MCV – MCH – lymphocytes% – eosinophils%.

Experiment 2:

2- Acetic intra-vaginal washing effects were:

- a) Highly significant ($P \leq 0.001$) on vulva color, sexual receptivity, LSB, alive, LS₂₁, LSW, LWB, LW₂₁ and LWW.
- b) Significant ($P \leq 0.01$) on MKWW.
- c) Insignificant ($P > 0.05$) on all blood parameters studied may be due to the difference of time between acetic washing treatment and sampling of blood.

Experiment 3:

1. Selenium source supplementation effects were highly significant ($P \leq 0.001$) on vulva color. The better results obtained when females fed Se mixed source supplementation.
2. The higher values of conception rate obtained when does fed organic Se ($95 \pm 9.186\%$), followed by does fed mixed Se ($85 \pm 9.186\%$) then does fed inorganic Se ($70 \pm 9.186\%$), while the control group has lower value of conception rate ($30 \pm 9.186\%$).
3. Treatment by Se supplementation effects were highly significant differences ($P \leq 0.001$) on sexual receptivity.
4. Selenium supplementation effects were highly significant ($P \leq 0.001$) on each of LS₂₁ and LSW and were significant ($P \leq 0.01$) on LSB and alive also, were significant ($P \leq 0.05$) on each dead% at birth, MR₂₁% and TPWM%.
5. Selenium source supplementation effects were highly

significant ($P \leq 0.001$) on LWB, LW21 and LWW and significant ($P \leq 0.01$) on MKW21.

6. Inclusion of Se in the does diets at different sources caused a highly significant ($P \leq 0.001$) differences in RBCs count.
7. Effects of Se supplementation and age of doe were insignificant ($P > 0.05$) on progesterone level.

CONCLUSION

The improvement of reproductive performance of rabbit is made possible through exogenous hormone, nutritional and washing methods. The present study suggests that $\text{PGF}_{2\alpha}$ could be used for improving reproductive performance of does rabbits. Also suggest that synthetic $\text{PGF}_{2\alpha}$ can be used to induce parturition. The $\text{PGF}_{2\alpha}$ plays role in RBCs synthesis and causes a significant increase in the number of WBCs. In does having a high plasma progesterone concentration, the $\text{PGF}_{2\alpha}$ could be effective in removing the progesterone block and further studied is needed with large scale and different breeds.

The acetic intra-vaginal washing could be effective in removing or decreasing the uterine infections which in turn reduce the life span of corpora lutea and then decrease progesterone level and increase mating acceptance. From this result the applied acetic intra-vaginal washing treatment improved the sexual receptivity of doe, need further studied and selected the best dilution of acetic acid may be increase the conception rate.

Concerning the nutritional treatment, the results refer to the rabbit need to selenium supplementation for improving reproductive efficiency.