The role of nursing system and dietary energy in improving the productive, reproductive and immunity performance in V-line rabbits

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Summary

The present study was carried out at El-Sabahiea Poultry Research Station, Alexandria Governorate, belongs to the Animal Production Research Institute, Agricultural Research Center during the seasons 2012/2013 from October to April. The objectives of this study were to determine the effect of employment controlled nursing and feeding regimens for improving the productive and reproductive performance and physiological response of the V-line rabbit does and the growth of their offsprings up to weaning.

This study including three experiments:

Experiment (1):

The aim of this experiment was to determine the effects of employment controlled nursing on the reproductive performance and physiological status of V-line rabbit from day 9 (at 09:00 h) until day 11 (at 08:30 h) of the lactation period.

A total of 45 mature nulliparous, V-line rabbits aged 6 to 7 month-old, with average live body weight (BW) 3314± 90 g were distributed randomly into five treatment groups (9 does each). Ten sexually matured V-line bucks proven fertile were used in this study for artificial insemination. Animals were healthy and clinically free of external and internal parasites.

Group 1: Control does nurse freely until day 14 (C).

Group 2: nursing (days 9–11) with a wire-mesh separation permits visual olfactory and acoustic contact (SW).

Group 3: nursing (days 9–11) with a metal-plate insertion no visual but possible olfactory, acoustic and vibration contact (SM).

Group 4: nursing (days 9–11) with a glass-plate separation permits visual and vibration contact (SG.)

Group 5: nursing (days 9–11) with a taking the kits with the nest-tray 5 meters away from doe cages and no contact (SN).

The results obtained from the first experiment could be summarized as follows:

1) There were no significant differences in plasma prolactin concentration between the control and LSS groups at 48h before AI. At the 24h before AI plasma prolactin concentration was significantly decreased ($P \leq 0.05$) at the LSS groups compared with the control. However, the results indicated that the plasma prolactin concentrations were significantly lower at 24h than 48h before AI among the different bio-stimulated does groups. At the 0h (at day 11 of lactation and after the suckling), and after GnRh injection, plasma concentrations of prolactin was significantly higher ($P \leq 0.001$) compared with previous recorded values for the same group on the days before 24h after doe–litter separation and lactating.

2) The data showed that no significant changes in the blood plasma oestradio level before 48h among treatment groups. At 24h before AI, SN group showed higher significant oestradiol value compared with SM group, no significant differences among the other groups.

After AI, the data showed that from 0h to 3h after AI and GnRh injection the control group had the lowest significant value in blood plasma oestradiol compared with nursing system groups. No significant differences were shown among the nursing system group, except at 0h where SM group had the

highest significant value in blood plasma oestradiol compared with other nursing system groups.

Comparing with the blood plasma oestradiol values between the period before and after AI regardless on the time by hours the data revealed that significant increase in this parameter at the period after AI compared before in all nursing system groups. No significant difference between the two periods for control group.

3) The data showed that no significant changes in the blood plasma LH level before 48h and 24h among treatment groups. After AI, the data revealed that at 0h no significant differencet among the different separation groups. From 1h to 3h after AI and GnRH injection the control group had the lowest significant value in blood plasma LH compared with the other nursing system groups. No significant differences were shown among the nursing system group.

4) The data showed that no significant changes in the blood plasma FSH concentration before 48h and 24h among treatment groups. After AI, the data showed that at 0h, 1.5h and 2.0h and GnRh injection, plasma FSH concentration had the highest significant value in SG group just compared with control group. No significant difference was obtained among the different separation groups and also, between all separation groups except SG does and control does. No significant differences were shown between LSS groups and control at 1h and 2.5h after AI. At 3h after AI the highest significant value in FSH concentration showed at SM group compared with SW group.

5) The data showed that the SM and SG groups had the highest significant values in the sexual receptivity, fertility and kindling

rate compared with control and the other nursing methods groups. On the other hand, there are insignificant increased between SW and SN in sexual receptivity and fertility rate parameters compared with control group, where the significant differences were shown among SW, SN and control groups in kindling rate.

The data showed that the SM group had the highest significant total born kits/litter compared the other nursing methods groups and control, where the highest significant total kits alive/litter were obtained in the SM, SG and SW groups compared both SN and control groups. The lowest significant values for both previous parameters were obtained in the control group. On the other hand, the highest significant mortality rate were shown in the SN and control groups compared with the SW, SM and SG groups which had the lowest significant mortality rate values with no significant difference among them.

Experiment 2:

The aim of this study was to determine the effect of employment controlled of feeding regimen (biostimulation) on productive performance of growing rabbit.

At the end of the experiment (84 days of age), five rabbits were slaughtered from each group to study the productive performance, biochemical parameters and carcass and meat quality.

Experimental Design:

Group 1(C): rabbits were fed commercial diet and representing the control group (C).

Group 2 (R1): rabbits feed restricted from fifth to the sixth weeks of age (50 g/d/rabbit).

Group 3 (R2): rabbits feed restricted from the eighth to ninth weeks of age (90 g/d/rabbit).

Group 4 (R3): rabbits feed restricted from the fifth to the sixth weeks of age and from eight to ninth weeks of age (90 g/d/rabbit).

The results obtained from the second experiment could be summarized as follows:

1) No significant differences were shown between the control and treatment groups for initial live body weight, total body weight and daily weight gain except, the R3 group which had lowest significant values in total body weight gain and daily weight gain parameters compared with the control and other treatment groups.

2) Administrated growing rabbits with feed restriction caused significant decrease in DFI, FCR and MR values compared with control group. The best significant improvement in FCR and MR were shown in R1 and R2 groups, while R3 group showed the lowest significant DFI compared with the other administrated groups.

3) Comparison among groups revealed that feed restriction had no significant change on carcass relative weight of growing rabbits except the R3 group which had the lowest significant value. On the other hand, no significant differences were shown between control and feed restriction groups for liver, kidney, spleen, testes, brain and lungs.

4) Subjected growing rabbits to feed restriction caused significant decrease in relative weight of loin compared with control group. The result in R3 group showed the lowest significant value in the relative loin weight with no significant different between R1 and R2 groups. On the other hand, the data revealed that R1 group had the highest significant increased in relative weight of skin compared with the control and the other feed restricted system (R2 and R3). No significant differences between treated and untreated groups were detected for hind and fore part and hind legs relative weight.

5) The apparent digestibility coefficient crude protein (CP) was significantly increase in all restricted groups compared with the control group, while this significant increase was obtained only in groups R1 and R2 in DM, NFE and DCP parameters. There were no significant differences found between restricted and non-restricted growing rabbits in OM, CF, EE and TDN parameters, except in the OM which the R2 group was significantly increased compared with control group.

6) Subjected growing rabbits to feed restriction caused significant decrease in Hb, PCV and RBC values compared with control group. No significant differences among treated groups and control were detected for WBC parameter.

7) Subjected growing rabbits to feed restriction caused significant decrease in blood plasma protein and globulin values compared with control group. No significant differences were detected among treated groups and control for albumin parameter.

8) Administration of growing rabbits to feed restriction caused non-significant decrease in blood plasma glucose. Blood plasma urea significantly decreased in treated groups compared with

control, the same significant trend was shown only between R3 group and control in blood plasma creatinine.

9) Subjected growing rabbits to feed restriction caused significant decrease in blood plasma total lipids, cholesterol and triglyceride compared with control group.

10) The results indicated that restricting the feed significantly decreased the meat content of dry matter, crude protein, and cholesterol besides ether extract significantly. Moreover, the results showed that differences in ash (%) did not statistically differ between experiments. Meat chemical composition is an important indicator for meat quality and feed restriction is one of several factors which affect the chemical composition. The decrease in dry matter contents associated with increase of moisture content.

11) Results indicated that feed restriction significantly increased color intensity and tenderness but decreased WHC linearly. A difference in pH was not significantly affected by feed restriction.

12) Feed restriction strategy of fattening weaning rabbits resulted in clear improvement of net revenue and relative economic efficiency as compared to the control group.

In conclusion, controlled nursing and the effects of feeding regimen for rabbit improved the productive and reproductive performance and economical efficiency.