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6. SUMMARY AND CONCLUSION

The present study was carried out at El-Sabahia Poultry Research Station (Alexandria Governorate), Animal Production Research Institute, Agricultural Research Center during period from October 2011 till May 2012 for 32 week. The study involved two experiment, doe rabbits (Experiment 1) and buck rabbits (Experiment 2) and aimed to investigate the effect of type of water and magnetically treated water on productive and reproductive performance of rabbits.

Experiment 1: (rabbit does)

Forty mature nulliparous V-line rabbits 6 to 7 month-old, averaged live body weight (BW, 3614±118 g) were assigned to four experimental groups in a factorial (2 water type × 2 magnetic treatment) as 10 does per group. The groups fed the same diet and were submitted to the following treatments: TW group, drinking tap water; WW group, drinking well water; MTW group drinking tap water exposing to the magnetic field of approximately 4000 gauss; MWW group drinking well water submitted to the same treatment of MTW group.

Number of service per conception, conception rate, litter sizes (total, alive and dead) at day of birth and kits body weight (g) at day 28 after parturition was recorded for five consecutive mating. Milk yield and composition of does were measured up to 28 days after parturition. Milk conversion ratio was calculated as g milk per g gain. Body weight gain, feed intake, feed conversion and mortality rate were recorded for litters through growing period from 6-12 weeks of age. Blood biochemical constituents were determined for each treatment group. The results can be summarized as following:

- 1- Well water had poor quality than those for TW. Moreover, magnetic treatment induced greater effect on WW than that on TW in terms of pH, conductivity, salinity, calcium, magnesium, total hardness and dissolved oxygen.
- 2- Well water decreased ($P \leq 0.05$) litter size, number of kits born alive, kit weight at birth and at day 28 of age, and MY, fat, lactose and energy compared to TW, but the number of dead kits at birth was increased and milk conversion ratio (MCR) was impaired.
- 3- Well water decreased ($P \leq 0.05$) indices of the renal and liver function, plasma estrogen and progesterone and total antioxidant capacity, but increased thiobarbituric acid-relative substances.
- 4- Exposure of water to the magnetic field increased ($P \leq 0.05$) conception rate, litter size, number of kits born alive, weight of kits at birth and at day 28 of age, MY and improved MCR compared to those of does drank un magnetized water.
- 5- Exposing of both TW and WW to the magnetic field improved ($P \leq 0.05$) renal function (urea and creatinine) and liver enzyme (AST) and reproductive hormones of dose compared to those of the unexposed water.
- 6- Magnetic treatment for doe significantly ($P \leq 0.05$) increased body weight gain of litters while decreasing mortality rate and feed intake, and improving feed conversion ratio of growing rabbits during wk 6-12 of age.

Experiment 2: (rabbit bucks)

Forty male V-line rabbits (an average 7.5 months old) were randomly distributed among four homogeneous groups of 10 bucks each in a 2×2 factorial design. The bucks fed the same diet and were submitted as in does trail. Daily feed intake (g/buck/day) and body weight (g/buck) were recorded during the experimental period. Reaction time and fertility percentage were recorded. 120 ejaculates were obtained to estimate ejaculate volume, sperm concentration, mass motility, abnormal sperm, dead sperm, live spermatozoa, normal sperm, total sperm output, total live sperm, total normal sperm and total functional sperm fraction. Blood samples were collected from all bucks at the end of the experiment to estimate blood biochemical constituents, antioxidants enzymes and lipid peroxidation biomarkers. Also, plasma testosterone, antibody titer, immunoglobulin and hematological traits were measured. The results could be summarized as following:

- 1- Magnetic treatments induced different responses depends on the water type e.g. tap vs. well water, pH (4.0 vs. 8.3%), conductivity (6.2 vs. 7.5%), salinity (8.3 vs. 1.9%), Ca (5.6 vs. 1.3%), Mg (2.1 vs. -21.8%), total hardness (3.7 vs. -11.0%) and dissolved oxygen (12.3 vs. 7.8%).
- 2- Magnetized WW resulted in complete recovery in body weight, feed intake, fertility and semen quality of bucks.
- 3- The improvements in fertility and semen quality concurred with increasing testosterone hormone, white blood cells (WBCs), lymphocyte and red blood cells (RBCs), hemoglobin (Hgb) and packed cell volume (PCV).
- 4- Magnetic exposure increased ($P \leq 0.05$) immunoglobulin e.g. IgG, IgM and IgA and antioxidant enzymes, but decreased thiobarbituric acid-reactive substances and malondialdehyde.

Conclusion:

Water stress as main tested by well water induced a significant decrease in productive and reproductive of doe and buck rabbits. Whereas, magnetic treatment resulted in improving water quality, productive and reproductive performance of doe and buck rabbits, milk yield and composition, semen quality, blood picture and antioxidant status and hence animal health. This may be intriguing in areas with limited water supply when well water is the main source for drinking.