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SUMMARY AND CONCLUSION

This study was carried out at Sakha Experimental Station, located in the northern part of the Delta, belonging to the Animal Production Research Institute (APRI), Agricultural Research Center, Ministry of Agriculture, in cooperation with Animal Production Department, Faculty of Agriculture, Mansoura University, during the period from July 2012 to November, 2013.

The aim of this study was to evaluate the effect of treatment with antioxidants: vitamins A (VA), AD₃E, selenium (Se), C (VC) or all together before September mating season, on productive and reproductive performances of crossbred ewes (1/2 Finnish Landrace x 1/2 Rahmni) and their offsprings.

Total of 72 adult ewes were divided into six groups: Ewes in the 1st group (G1) served as a control without treatment, while those in treatment groups were treated : orally with VA (G2); injected with AD₃E (G3); Se (G4); VC (G5), all together (G6). Weight (LBW) of ewes, placenta (PW), milk yield, reproductive performance of ewes and lambing performance were determined. Concentration of P₄ in serum blood of ewe after 5, 30, 40 and 50 d post-mating, and total proteins (TP), albumin (AL), globulin (GL) and cholesterol in serum blood lambs at weaning were determined.

The obtained results could be summarized as the following:

During September breeding season:

- The average live body weight of ewes before mating and after lambing was not affected by treatment.
- Average of placental weight of ewes was lower ($P < 0.05$) in G2 (378 g) than in G1, G3, G4, G5 and G6 which have the range of placental weight 410 to 457 g. Average of placental weight of ewes which lambing male have higher placental weight than female and twins placental weight than single.
- Average daily milk yield of ewes during suckling period was not affected by treatment. Also, milk composition was not affected by treatment, except only fat percent in milk of ewes in G3 was significantly ($P < 0.05$) increased as compared to all treatment groups.
- Oestrous rate was 0, 25, 33.3, 16.7, 25 and 16.7% ($P < 0.05$) during the transit period pre-September mating and 100, 91.7, 91.7, 100, 100 and 100% ($P < 0.05$) at the end of September breeding season in G1, G2, G3, G4, G5 and G6, respectively.
- Progesterone concentration (ng/ml) was not affected by treatment, but significantly ($P < 0.05$) increased by advancing post-mating.

- Fertility rate was 83.3, 91.67, 75.0, 75.0, 91.67 and 91.67% ($P < 0.05$) in G1, G2, G3, G4, G5 and G6, respectively. The corresponding values of fecundity rate were 125, 145, 109, 122, 108 and 108%, respectively, and the twinning rate were 150, 145, 133, 122, 118 and 118, respectively.
- Ewes in G6 produced less males and more females (38.5 vs. 61.5%, $P < 0.05$) than in other treatment groups. Ewes in G1 showed the highest ($P < 0.05$) twins births (50%) and the lowest ($P < 0.05$) single births versus an opposite trend in other treatment groups (G3-G6).
- Mortality rate of lambs at birth was 0% in G1, G2 and G6 compared with 8.33, 9.09 and 7.69% in G3, G4 and G5, respectively. While, mortality rates at weaning were 0% in all treatment groups.
- Lambs were heavier ($P < 0.05$) in G1, G4, G5 and G6 than in G2 and G3. Males and singles were heavier than females and twins.
- Lambs of G6 showed the highest ($P < 0.05$) concentration of total protein, albumin and globulin vs. the lowest values in lambs of the control group and moderate values in the other treatment groups (G2-G5). Cholesterol concentration significantly ($P < 0.05$) increased in G2 and G6 as compared to the controls.

During May breeding season:

- Average live body weight of ewes before and after mating was not affected by treatment.
- Oestrous rate was 0.0, 8.33, 25, 16.67, 8.33 and 25% ($P < 0.05$) during 1-15 May and 25, 50, 58.33, 58.33, 41.66 and 58.33% ($P < 0.05$) at the end of May breeding season in G1, G2, G3, G4, G5 and G6, respectively.
- Fecundity rates were 100, 133.3, 100, 114.3, 120 and 85.7% ($P < 0.05$) in G1, G2, G3, G4, G5 and G6, respectively. The corresponding values for twinning rate were 100, 133.3, 116.7, 114.3, 150 and 120%, respectively.
- Ewes in all treatment groups, except those in G6 significantly ($P < 0.05$) produced more male lambs and less female lambs than the control group. Ewes in G2 showed significantly ($P < 0.05$) the greatest males and the least females as compared to other treatment groups. However, sex ratio of lambs in G6 did not differ significantly from that in the control.
- Ewes in the control group did not produce twin lambs, however, in all treatment groups ewes produced higher twins and lower single births

and ewes in G5 produced the highest twins (50%) and the lowest single birth (50%).

- Mortality rates of produced lambs at birth was 0% in G6 vs. (1/8, 12.5% in each of G2 and G4, (1/6, 16.67%) in G5 and (2/7, 28.57%) in G3 and (1/3, 33.3%) in G1.

In conclusion, treatment of ewes prior to September breeding season with antioxidants such as vitamins (A, AD₃E or C), selenium or all together had impact on body condition of ewes after lambing, plcantal weight, performance of lambs, with the best results for ewes treated with Vitamins A, C and all together for improved fertility rate ; vitamin A or Se which improved fecundity rate and vitamin A and AD₃E which improved twining rate.

During May breeding season, the main goal of this study, the best results of ewes was treatment with Se which improved fertility rate; Vit. A which improved fecundity rate or Vit. C which improved twining rate.

The breeders can choose which treatment of antioxidants gives him the maximum utilization of ewes throughout their productive life for improving fertility or fecundity or twining rate with the lowest costs.