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SUMMARY

This study was carried out at Sakha Animal Production Research Station, Kafrelsheikh Governorate, belonging to Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture in cooperation with Department of Animal Production, Faculty of Agriculture, Mansoura University, during the period from August, 2012 to November, 2013.

This study included two experiments to evaluate the effect of some hormonal protocols on reproductive performance of ewes during September (1st experiment) and May breeding season (2nd experiment).

Total of 88 crossbred ewes ($\frac{1}{2}$ Rahmani x $\frac{1}{2}$ Finish Landrace), having 3-4 years old were used in this study (40 ewes in the 1st experiment and 48 ewes in the 2nd one).

First experiment (September 2012):

This experiment was carried out during September breeding season from 15/8/2012 to 30/9/2012.

Total of 40 crossbred ewes were used in this study. Ewes were divided into five similar treatment groups (8 ewes/group) according to age, body weight and physiological condition as follows:

The 1st group (G1): Ewes represented the control ewes which were allowed for natural mating without any treatments and natural mating was applied for those coming in estrus.

The 2nd group (G2): Ewes were treated with 20 mg Cronolone vaginal impregnated sponges. For each ewe, sponge was inserted (day 0) and remained intravaginal for 11 days. Each ewe was intramuscularly (i.m.) injected with 300 IU PMSG on the day of sponge withdrawal (day 11). Ewes in heat (responded ewes) were artificially inseminated with fresh semen.

The 3rd group (G3): Ewes were treated with 20 mg Cronolone vaginal impregnated sponges. The sponge was inserted (day 0) and remained intravaginal for 11 days. About 24 h before sponge withdrawal (day 10), each ewe was injected with 25 mg progesterone (1 ml Lutone). Each ewe was i.m. injected with 300 IU PMSG on day of sponge withdrawal (day 11). Ewes in heat (responded ewes) were artificially inseminated with fresh semen.

The 4th group (G4): Ewes were treated with 20 mg Cronolone vaginal impregnated sponges. The sponge was inserted (day 0) and remained intravaginal for 11 days. Teaser ram was introduced to treated ewes after sponge withdrawal from sponge removed to AI with fresh semen.

The 5th group (G5): Ewes were treated with 20 mg Cronolone vaginal impregnated sponges. The sponge was inserted (day 0) and remained intravaginal for 11 days. About 24 h before sponge withdrawal (day 10), each ewe was injected with 25 mg P4 (1 ml Lutone). Teaser ram was introduced to treated ewes after sponge withdrawal from sponge removed to AI with fresh semen.

Second experiment (May 2013):

This experiment was carried out during May season from 15/4/2013 to 30/11/2013.

Total of 48 crossbred ewes were used in this study. Ewes were divided into six similar treatment groups (8 ewes/group) according to age, body weight and physiological condition as follows:

The 1st group (G1): Ewes represented the control ewes which were allowed for natural mating without any treatments and natural mating was applied for those coming in estrus.

The 2nd group (G2): Ewes were treated with 20 mg Cronolone vaginal impregnated sponges. The sponge was inserted (day 0) and remained intravaginal for 11 days. Each ewe was i.m. injected with 500 IU PMSG on the day of sponge withdrawal (day 11).

The 3rd group (G3): Ewes were treated with 20 mg Cronolone vaginal impregnated sponges. The sponge was inserted (day 0) and remained intra-vaginal for 11 days. About 24 h before sponge withdrawal (day 10), each ewe was injected with 25 mg P4 (1 ml Lutone). Each ewe was i.m. injected with 500 IU PMSG on the day of sponge withdrawal (day 11).

The 4th (G4) and 5th groups (G5): The same treatment of ewes during September breeding season.

The 6th group (G6): The same treatment of G2 in this experiment, but the sponge was inserted intra-vaginal only for 6 days. Each ewe was i.m. injected with 500 IU PMSG on the day of sponge withdrawal (day 6).

The main results can be summarized as followed:

1. First experiment (September breeding season):

- During the interval from breeding season (September) to pre-lambing, LBW of ewes showed marked increase in all groups due to incidence of pregnancy, then decreased post-lambing in all groups to be nearly similar to LBW during breeding season.
- Results show that all ewes (100%) in each treatment group responded to treatment and exhibited estrus. However, estrus rate was significantly ($P<0.05$) higher in all treatment groups (G2-G5) than in control one (G1), being 100 vs. 50%.
- Results show that average time of estrus onset from sponge withdrawal was significantly ($P<0.05$) the latest with the longest duration ($P<0.05$) in ewes of G5 (45.0 and 26.8 h, respectively), while those in G2 showed an opposite trend (30.0 and 23.0 h, respectively).
- Results show that pregnancy and lambing rates were significantly ($P<0.05$) higher in control ewes (G1) than in all treated ewes (G2-G5), being 100, 75, 62.5, 62.5 and 75% in G1, G2, G3, G4 and G5, respectively.
- Results revealed that ewes in G2 and G3 produced greater number of borns than that produced from ewes in other treatment and control groups.
- Results showed that the effect of treatment on type of births produced was significant ($P<0.05$). Only ewes in G2 showed percentage of single and twin

lambs similar to the control group. However ewes in G3 produced significantly ($P<0.05$) the highest percentage of twin lambs as compared to other treatments and control group.

- All pregnant ewes in the control group showed ovarian activity starting nearly one week prior to breeding season, whereas P4 level ranged between 4.306 to 12.230 ng/ml in pregnant versus less than 0.5 ng/ml in non-pregnant ewes during the transit period.
- In G2 and G3, P4 concentration was higher in pregnant than in non-pregnant ewes and increased thereafter in pregnant indicating ovulation and pregnancy incidence, but P4 reduced in non-pregnant after sponge removal.
- The differences in average LBW of lambs at birth between all treatment groups and the control one were not significant, but lambs produced from ewes in G4 and G5 tended to be lighter than those of other groups. The significant ($P<0.05$) differences were recorded among groups at weaning. Only lambs in G3, G4 and G5 were significantly ($P<0.05$) lighter than the control lambs. The same trend was recorded for average LBW of lambs at birth and weaning among groups based on sex and type of birth.

2. Second experiment (May breeding season):

- The effect of treatment on LBW of ewes was not significant. However, during the interval from May to November, LBW of ewes in all groups tended to increase. These results indicated no effect of different treatments on LBW of ewes pre- or during breeding season.
- Results show significant ($P<0.05$) of treatment on estrus rate of ewes. Estrus rate was significantly ($P<0.05$) higher in G2, G3 and G6 than that in the control group (G1). However, estrus rate did not differ significantly in G4 and G5 from that in G1.
- All ewes showed (100%) estrus rate which treated with short term sponge (6 days) and PMSG at sponge withdrawal (G6) and 87.5% of those treated with long term sponge (11 days) and PMSG at sponge withdrawal (G2) showed estrous activity.
- Results show that average time of estrus onset from sponge withdrawal was and estrous duration were affected significantly ($P<0.05$) by treatment.

- In comparing long- with short- term treatment (G2 vs. G6), it was found that long term treatment (12 d) delayed estrus activity, but did not affect estrous duration as compared to short term treatment.
- Results show that pregnancy and lambing rates were significantly ($P < 0.05$) higher in control ewes (G1) than in all treated ewes (G2-G6), being 100, 85.7, 50.0, 50.0, 33.3 and 75% in G1, G2, G3, G4, G5 and G6, respectively.
- Also, ewes in G6 (short-term treatment) showed higher pregnancy, lambing and fertility rates with higher litter size (1.33/ewe) and fecundity rate (100%), being slightly lower than that in G2, but the differences were not significant.
- P4 level of the control ewes was above 0.1 ng/ml during early period of May season, such trend indicated incidence of ovarian activity for some ewes in the control group during May season.
- Changes in P4 level in ewes of G2, G3, G4 and G5 showed that there was marked increase in P4 level by advancing day of sponge insertion and sharp decreased after sponge withdrawal, indicating response of ewes to be in heat at AI (day 13) and in pregnant ewes showed increased of P4 than 1.0 ng/ml in pregnant than those in non pregnant.

In conclusion, the findings of the present research indicate that primary P4 and PMSG is a beneficial adjunct to the breeding of sheep by AI at progestagens-synchronized estrus and administration of 300 IU PMSG at sponge withdrawal is more effective for increasing the reproductive performance of artificially inseminated crossbred ewes in September breeding season. In May season, progestagens-synchronized estrus (long term for 12 d or short term for 6 d) and administration of 500 IU PMSG at sponge withdrawal improved the reproductive performance of artificially inseminated crossbred ewes.