

SYNCHRONIZATION OF ESTRUS WITH PGF ANALOGUE
IN EWES AND GOATS DURING TWO SEASONS

BY

AL-SAADY, H.A.K.¹ AND AL-ATTIA, H.H.²

Department of Theriogenology ¹, Department of Pharmacology and Toxicology ², College of Veterinary Medicine, Baghdad University, Baghdad, Iraq.

SUMMARY

Trials had been made for synchronization of estrus in both ewes and goats during Summer and Autumn seasons following double injection of PGF 2 α . The results showed that the synchronization of estrus as well as the conception rates in ewes were lower than that of the goats during both seasons.

INTRODUCTION

It is well known that estrus cycle is the first step in the cycle of animal reproduction, especially the actual estrus which is accompanied with sound ovulation. In order to improve the animal fertility it is necessary to increase the percentages of estrus incidences through their induction or synchronization hormonally. Among the commonly used hormones in estrus synchronization is the prostaglandin (PGF 2 α) or it's analogues due to their luteolytic activity on the ovarian corpus luteum in sheep (1-5) and in goats (6-9). Therefore, the presence of corpora lutea are necessary for the synchronization of estrus hormonally in domestic animals (10-11) irrespective to their breeding seasons (12). Although cyclic corpora

lutea are more sensitive to luteolytic activity of prostaglandin than those of pregnancy (13), yet double injections of PGF_{2α} or their analogues, 7- 11 days apart seemed to be necessary (14-19). The aim of this work was to study the efficiency of PGF_{2α} analogue in synchronization of estrus in ewes and goats during summer and Autumn seasons.

MATERIALS AND METHODS

Flocks of Awassi ewes and Karadi goats with age ranged between 3-5 years and weights ranged between 30-55 kg for ewes and 25-45 Kg for goats were used as experimental animals. The animals were divided in 8 groups as follows:-

Group No.1 was consisted of 6 ewes used as control during

Summer.

Group No.2 was consisted of 10 treated ewes during Summer.

Group No.3 was consisted of 6 goats used as control during Summer.

Group No.4 was consisted of 9 treated goats during Summer.

Group No.5 was consisted of 6 ewes used as control during Autumn.

Group No.6 was consisted of 10 treated ewes during Autumn.

Group No.7 was consisted of 6 goats used as control during Autumn.

Group No.8 was consisted of 10 treated goats during Autumn.

The ewes and goats in the treated groups received double injection regime (nine days apart) of 1 ml Prosalvin which contains 7.5 mg prostagandin F2 α (Intervet, International, B.V.- Boxmeer-Holand) intramuscularly.

During 72 hours post PGF_{2α} injection, estrus was detected in the treated animals by detector ram and buck and through the external genital examination (congested, swollen and oedematus vulva, presence of clear mucous discharge inside the congested vagina) and the last

recorded dates of the females matings were regarded as the first day of pregnancy. The conception rates of the treated groups were confirmed by the actual lambing for ewes and kidding for goats.

RESULTS

The results were summarized in tables 1 and 2 showed that the percentage of ewes in estrus and those became pregnant in the control groups (groups 1&5) were 16.7% and 0.0 % during Summer, 66.7% and 50% during Autumn respectively. The percentage of ewes that came in estrus and those became pregnant in the treated groups (groups 2 & 6) were 40% and 20% during Summer, 80% and 60% during Autumn, respectively.

Table 1: Estrus synchronization and conception rates in ewes following PGF_{2α} injections during Summer and Autumn.

Seasons	Controlled Animals			Treated Animals		
	No.	Estrus	Pregnant	No.	Estrus	Pregnant
Summer	6	1 (16.7)*	-	10	4 (40)	2 (20)
Autumn	6	4 (66.7)	3 (50)	10	8 (80)	6 (60)

* Figures between paranthesis represent percentages.

The percentage of goats that came in estrus and those became pregnant in the control groups (groups 3&7) were 50% and 33.3% during Summer, 83.3% and 66.7% during Autumn, respectively. The percentage of goats that came in estrus and those became pregnant in the treated groups (groups 4 & 8) were 77.8% and 66.7% during Summer, 90% and 80% during Autumn, respectively. However, only one goat among flocks had a twin.

Table 2: Estrus synchronization and conception rate in goats following PGF 2 α injections during Summer and Autumn.

Seasons	Controlled Animals			Treated Animals		
	No.	Estrus	Pregnant	No.	Estrus	Pregnant
Summer	6	3 (50)*	2 (33.3)	9	7 (77.8)	6 (66.7)
Autumn	6	5 (83.3)	4 (66.7)	10	9 (90)	8 (80)

* Figures between paranthesis represent percentages

In comparison between the percentage of the animals that came in estrus and those became pregnant in both species, it had been found that the goats showed higher values than those of the ewes during both seasons ($P < 0.05$).

DISCUSSION

Since the results showed that the estrus percentages in the ewes of the control groups during Summer were lower than those of the Autumn, it could be concluded that the effect of high temperature and the long day light periodicity during Summer were the main causes, and confirms the claim of word (20) who classified the sheep in general as short-day breeders.

On the other hand, the induction of estrus in ewes during this season (Summer) following the prosolvin could be due to the luteolysis of the persistent ovarian corpora lutea present in some ewes following the weaning of their lambs at the end of Spring (12). Moreover, the lower conception rate of the ewes following the prosolvin treatments during both seasons (Summer and Autumn) might be due to faulty sperm transportation that usually occurs during the estrus synchronization or due to early embryonic death (21-23).

On the other hand, the estrus percentage in both the controlled and the treated goats were higher in comparison to those ewes during both seasons and this indicated that the goats were less affected by the breeding season. This finding was in agreement with finding of Smith (23) who reported that goats near the equator are polyestrous all the year around.

Concerning the induction and synchronization of estrus in both species during both seasons were due to the luteolytic activity of the prosolvin (PGF_{2α}) on the ovarian corpora lutea as it is confirmed by (3-5) in ewes and by (6-9) in goats.

REFERENCES

1. Thorbura, G.D. and Nicol, D.H. (1971) . Regression of the Ovine Corpus Luteum after Infusion of PGF_{2α} in the Ovarian artery and Uterine Vein. J. End. 51:795-6.
2. Goding, J.R. Cain, M.D.; Cerini, M. Chamley, W.A. and Cumming , I.A. (1972). Prostaglandin F₂ is the Luteolytic Hormone in the Ewes. J. Reprod. Fert. 23:146-7.
3. Goding, J.R. (1974). The Demonstration that PGF₂ is the Uterine Luteolysis in the Ewes. J. Repral. Fert. 38: 261-71.
4. Peterson, A.J.: Tervit, H.R.: Fairclough, r.J. ; Havik, P.G. and Smith, J.F. (1976). Jugular levels of 13,14-Dihydro-15-Keto-Prostaglandin F₂ and Progesterone around Luteolysis and Early pregnancy in the Ewe. Prostaglandins. 12: 551 -8.
5. McCracken, J.A.; Schram, w.; Barcikouski, B. and Wilson, 1. (1981). Prostaglandin in Animals reproduction. Acta. Vet. Scaud. (Snppl.) 77: 71-88.
6. Scott, D. and Robinson, J.J. (1976). Changes in the concentrations of Urea, Glucose and Some Elements in the Plasma of the Ewe Daring Induced Partarition. Res. Vet. Sci. 20: 146-7.

7. Bosu, W.T.K., Serna Caribay, J.A. and Barker, C.A.V. (1979). Peripheral; Plasma levels of Progesterone in Pregnant Goats and Ewes Treated with PGF₂. *Theriogenology* 11: 131-48.
8. Day, A.M. and Southwell, S.R.G. (1979). Termination of Pregnancy in Goats using Cloprostenol. *N.Z. Vet. J.* 27: 207-8.
9. Cooke, R.G. and Knifton, A. (1980). Removal of Corpus Luteum in Pregnant Goats. Effect of intrauterine Indomethacin. *Res. Vet. Sci.* 29: 77-44.
10. Inskeep, E.K. (1973). Potential uses of Prostaglandins in control of Reproductive cycles of Domestic Animals. *J. Anim. Sci.* 36: 149-57.
11. Douglas, E.D. and Ginther, C.F. (1973). Luteolysis following Single of Prostaglandin F₂ in sheep. *J. Anim. Sci.* 37: 990-3.
12. Acritopoulou, S. (1979). Prostaglandin and L.H. Concentration in ewes after ICI 80996 Analogue of PGF₂ at two different stages of the Breeding season. *Theriogenology* 11: 411-20.
13. Pratt, B. R. Butcher, R.L. & Inskeep, E.K. (1975). Intrafollicular PGF₂ on Day 13 in bred & nonbred ewes. *J. Anim. Sci. Vet.* 41. P374.
14. Vlachos, K. (1979). Estrus synchronization of ewes with Prostaglandin (Dinoprost) Injections During Estrus and Anestrous. *Vet. Bull*, 50. No. 6870. (1980).
15. Britt, J.H. and Roche, I.F. (1980). Induction and Synchronization of Ovation, In the : *Reproduction in Farm animals* pp. 546-8, 4th. ed., E. SE. Hafez (eds.), Lea and Febiger, Philadelphia.
16. Loubser, P. G. and Van Niekerk, C.H. (1981). Estrus Synchronization in sheep with Progesterone Impregnated (MAP) Intravaginal Sponges and Prostaglandin and in Analogues. *Theriogenology*. 15: 547-52.
17. Thiomnier, J. (1981). Prostaglandin in Animal Reproduction. *Acta. vet. Scand. (Suppl.)* 77: 193-209.
18. Arthur, G.J.; Noakes, D.E. and Pearson, H. (1985). ewes. *Veterinary Reproduction and Obstetrics*. 5th. Ed., Bailliere Tindall, London.

19. Rommel, W.; Runge, M.; Richter, A. and Kutzsche, E. (1985). Suitability of Cloprostend preparation (Oestrophan Injectable) for Synchronization of Estrus and Ovation for Timed A.I. of Mutton Sheep. Vet. Bull. 55: 804 (No. 6589) (1985).
20. Ward, W. R. (1980). The Breeding season and the Estrus cycle (ovine). Section 10 pp. 889-91. In the current Therapy (Theriogenology) (1980) , D.A. Morrow (edr.), W.B. Saunders Company, Philadelphia.
21. Robinson, T.J. (1967), The control of the Ovarian cycle in the sheep. Sydney Univ. Press, Sydney.
22. Lightfoot, R.J.; Croker, K.P. and Marshall, T. (1976). Sheep Breeding. Proc. Int. Cong. Muresk, west. aust. Inst. Tech. pp. 449.
23. Smith, M.C. (1980). Caprine, Section 9 p.p 969 in the current Therapy (Theriogenology , D.A. Morrow edr.), W.B. Saunders Company. Philadelphia.

توحيد الشبق باستخدام مستحضر البروستاكلاندين
في كل من النعاج والماعز بمواسم مختلفة

حسين عبد الكريم السعدي / فرع التوليد والامراض التناسلية
هاشم العطية / فرع الادوية والسموم
كلية الطب البيطري / جامعة بغداد

الخلاصة

تم توحيد الشبق في كل من النعاج والماعز اثناء الصيف
والخريف باستخدام جرعتين من مستحضر البروستاكلاندين F2 &
واشارت النتائج على ان توحيد الشبق ونسبة الاخصاب في النعاج
اوطء مما عليه في الماعز اثناء كلا الموسمين.