دراسة تأثير الحقن بهرمون البروجستيرون والدفع الغذائى على تنظيم دورة الشبق فى نعاج الأوسيمى

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الملخص العربى

أجريت هذه الدراسة بمزرعة الانتاج الحيوانى التابعة لكلية الزراعة جامعة أسيوط على ٥٦ نعجة أوسيمى قسمت الى ثلاثة مجاميع وغذيت على مواد مركزة لمدة أربعة أسابيع قبل بدء الحقن بهورمون البروجستيرون ٠

اعتبرت المجموعة (أ) كمقارنة أما المجموعتين (ب،ج) فقد حقنت فى العضل بمعدل ١٥ ملليجرام ، ٢٠ ملليجرام بروجستيرون على الترتيب يوما بعد يوم ثمان مرات متتاليه ٠

واستعمل التلقيح الصناعى بمعدل مرتين للنعاج التى أظهرت الشياع وكان ذلك فى مدة تتراوح من ٦ ـ ٢٤ ساعة من وقت الكشف عن الشياع ٠ كما أخذت مسحة من منطقة عنق الرحم وفحصت ميكروسكوبيا لمشاهدة التشبعات الشرخسيه ، للتأكد أنها فى دور الشياع ٠ ويمكن تلخيص النتائج فيما يلى : ـ

١ ـ معدل ٢٠ ملليجرام من البروجستيرون كان كافيا لايقاف ظهور الشبق فى نعاج الأوسيمى، بعد دفعها غذائيا ، لمدة أطول من دورة شبق واحدة

٢ ـ نفس المعدل (٢٠ ملليجرام) كان أنسب فى تقليل عدد الأيام التى أظهرت فيها المجموعة (ج) الشياع (٧ أيام) بمقارنتها بالمجوعتين أ ، ب (١٣ ، ١٠ أيام على الترتيب) ٠

٣ ـ نسبة التوائم المولودة الى الأمهات كانت أعلى فى المجموعة ج (١٤٢ر٢٢٪ عن المجموعين أ ، ب ٠(١٢٥ر٠٠٪، ١٢٣ر٥٣٪ على الترتيب) وعلى ذلك فان معدل ٢٠ ملليجرام بروجستيرون يمكن اعتباره مناسبا لتنظيم دورة الشبق فى نعاج الأوسيمى وزيادة التوائم الناتجة من الأمهات بعد دفعها غذائيا

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THE SYNERGISTIC ACTION OF PROGESTERONE ADMINISTRATION AND FLUSHING IN OSSIMI EWES

(With 2 tables and one figure)

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SUMMARY

Three groups of Ossimi ewes were flushed by feeding a concentrate ration for 4 weeks before treatment with progesterone.

The first group (A)was considered as control while the others (B&C) were intramuscularly injected with 15 mg. and 20 mg. progesterone, respectively: every other day for 8 occasions.

Ewes detected in heat were artificially inseminated twice during the period ranged from 6 to 24 hours from the onset of heat.Smears were taken from the cervix of each ewe to assure the occurrence of heat by the presence of large sized arborization.

The results could be summarized in the following :

1—20mg.progesterone could cease the incidence of estrus in Ossimi ewes, after flushing, for a period of more one estrous cycle.

2—The same dose could shorten the number of days used to inseminate all the females in group C (7 days) if compared to the other two groups A & B which needed 13 and 10 days, respectively.

3—The percentage of lambing was higher in group C (142.22%) than in groups A and B (125.00 and 123.53%, respectively.) Thus the use of 20 mg, progesterone was recommended to be satisfactorily synchronize the estrous cycle in Ossimi ewes in order to increase the incidence of lambing especially after flushing

INTRODUCTION

As early as 1956, ROBINSON demonstrated that a series of progesterone injections to ewes during the breeding season would suppress estrus and *when the* injection were discontinued, the ewes came into estrus within few days.

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Although DAVIES (1960) and LAMOND (1962) reported a distressingly low levels in the conception rate of synchronized ewes, ROBINSON(1961), BRUNNER *et al.* (1964); HINDS *et al.* (1964); PRETORIUS (1967) and WALKER (1972) obtained favourable results. Nowadays, there has been much interest to synchronize the estrus cycle of ewes as a modest technique in sheep farming practice as it could allow a much more widespread application of artificial insemination and breeding.

ROBERTS and EDGAR (1966); THOMAS(1967);GORGON *et al.*(1969) and WALKER (1972) could control the estrus of sheep with progestagen impregnated intravaginal sponges. Other investigators (DZIUK, 1964; HOWELL and WOOLFITT, 1964; SCHALK, 1966; PRETORIUS, 1967; OSTROUMOVA, 1970; and SHEVAH *et al.*, 1975 used variable doses of progesterone either per rations or per injection to regulate the estrous cycles in breeding ewes with or without-pregnant mare's serum.

As far as has been ascertained from the available literature (GHANEN, 1964; ROBERTSON and RAKHA, 1965; LEES, 1966; MEAKER, 1971 and TORRELL *et al.*, 1972), little information is known about synchronization of estrus after flushing in sheep. In Egypt, however, only OLOUFA (1964) could synchronize the estrous cycle of mature local breed of sheep with 58 mg. provera daily and found that conception rate was not affected by the treatments.

The aim of the present work is to study the synergestic action of progesterone administration and flushing upon the fertility and rate of lambing of Ossimi ewes after adopting the artificial insemination as a breeding technique.

MATERIALS AND METHODS

The present work was carried out at the Animal Experimental Station, Faculty of Agriculture, Assiut University, Egypt; during the year 1975-1976.

Fifty six Ossimi ewes ageing 2-6 years were flushed by feeding a concentrate ration for 4 weeks before treatment with progesterone. The ration was composed of mixture diet of concentrates (65% undecorticated cotton seed cake, 20% wheat bran, 12% rice bran, 2% calcium carbonate and 1 % sodium chloride). One kilogram per head of the mentioned mixture was offered daily to the animals.

The animals were divided into three groups, A (20 ewes), B (17 ewes) and C (19 ewes). The first group (A) was considered as control while the others (B & C) were intramuscularly injected with 15 and 20 mg. progesterone respectively every other day for 8 occasions. The progesterone was obtained from Organon Oss. Holland and its oily solution was prepared as described by HARASZTI (1973).

Heat was detected by the aproned ram as certained by the examination of the cervical mucus for the presence of large sized arborization (OSMAN and BAKASAI, 1970). Ewes were artificially inseminated twice during the period ranged from 6 to 24 hours from the onset of heat. The used semen was collected from 6 healthy fertile rams and extended with egg-yolk citrate dihydrate according to EL-ALAMY and EL-HOMMOSI (1975). The speculum was used for the insemination.

The ewes returned to heat were inseminated again with the extended semen collected from the same ram used before. The data of lambing as well as the number of lambs born were included in the present data.

RESULTS AND DISCUSSION

It is evident from table (1) that 20 mg. progesterone every other day for eight consecutive times cease the incidence of estrus in Ossimi ewes, after flushing, for a period of more one estrous cycle. Similar results were reported by DENNY and HUNTER (1958) who used a daily injection of 10 mg. progesterone to synchronize estrus in sheep. In addition, DUTT(1953) found that injection of 30 mg. of progestdrone every third day, seemed to be successful. On the ground of there findings, it seems possible that breed variations play a minor role with the effective doses of progesterone to synchronize the estrous cycle in sheep.

The present results however, illustrated that the dose of 15 mg. progesterone injected every other day was not sufficient to synchronize estrous cycle in Ossimi ewes. Since two ewes in group B came in heat during the period of hormone injection (Table 1).

It can be seen from figure(1) that 20 mg progesterone could greatly shortened the time needed to inseminate all the females in group C (7 days) if compared to the other two groups A & B (13 and 10 days, respectively).

From data in table (1) and figure (1),it is interesting to note that, in group (C) about 75% of the ewes exhibited estrus within five days period after last injection of the hormone, compared with only about 40% in group (B) during the same period. In the control group (A), only 20% of ewes had exhibited estrus during this period. This result is in accordance with that reported by ABLE *et al.* (1964). who found that 81.2% of the treated ewes came in heat within four days after the last feeding of the hormone, compared with only 26.7% of the control ewes.

Data in table (2) showed that after the first insemination, the control group had higher conception rate (75%) than the other treated groups B & C ABLE *et al*(1964) found that the conception rate from the first service was only 56%for the synchronized group while it was 60%for the control. On the other

TABLE 1.—Insemination Data

Date of Insemination	Group A (Control)			Group B (15 mg. prog.)*			Groap C (20 mg. prog*)		
	Inseminated ewes			Inseminated ewes			Inseminated ewes		
	Individ. No.	Tot. No.	Returned No.	Individ No.	Tot No.	Returned No.	Individ No.	Tot. No.	Returned No.
18/6/1975	1	1	1	1	1	1	—	—	—
19/6/	1	2	—	—	1	—	—	—	—
22/6/	1	3	—	—	1	—	—	—	—
23/6/	4	7	2	—	1	—	—	—	—
25/6/	—	7	—	1	2	1	—	—	—
28/6/	1	8	1	—	2	—	—	—	—
29/6/	2	10	—	—	2	—	—	—	—
2/7/	2	12	—	2	4	2	—	—	—
3/7/	1	13	—	2	6	—	3	3	—
4/7/	1	14	—	2	8	2	10	13	6
5/7/	—	14	—	1	9	1	1	14	1
8/7/	1	15	—	—	9	—	—	14	—
10/7/	2	17	—	—	9	—	—	14	—
12/7/	2	19	1	—	9	—	—	14	—
13/7/	1	20	—	—	9	—	—	14	—
19/7/	—	—	—	1	10	—	—	14	—
20/7/	—	—	—	3	13	—	1	15	—
21/7/	—	—	—	3	16	—	2	17	—
22/7/	—	—	—	—	16	—	1	18	—
25/7/	—	—	—	1	17	—	1	19	—

* The injection with progesterone started on 14/6/1975 and ended on 28/6/1975..

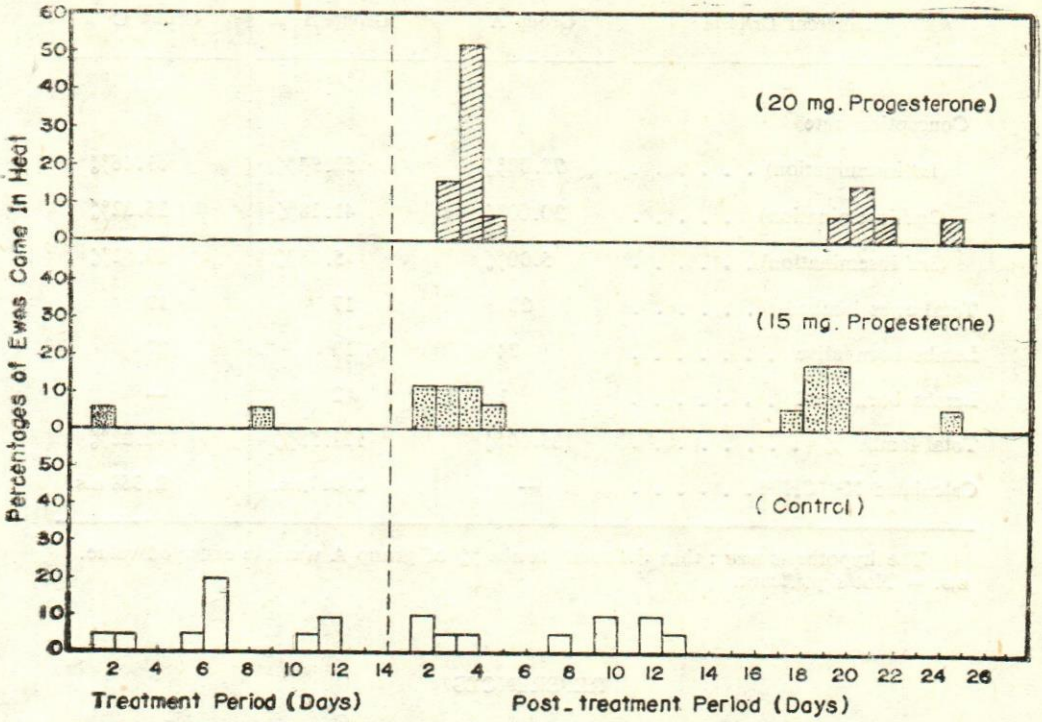

Fig. 1 : Effect of Progesterone Injection on Estrus Synchronization

hand, data in table(2) presented that the conception rate of the treated groups from the second and third insemination were higher than those of the control group. This is mainly attributed to the relatively large number of treated ewes failed to concieve after the first insemination. These results support the conclsuion of other workers, namely that a high level of fertility and synchronization is obtained at the second estrus (FORD, 1966 and CUNNINGHAM *et al.*, 1967). QUINLIVAN and ROBINSON (1967) suggested that, progesterone treatment may be follwed by an abnormal patern of sprem transport. Accordirg to this suggestion the low conception rate obtained from the first insemination after treatment could be explained.

Moreover, it is clear that the lamb percentage was higher in group C (142.22%) than in groups A&B (125.00% and 123.53%, respectively). This may lead us to advice the use of 20 mg. progesterone to synchronize the estrous cycle in Ossimi ewes in order to increase the incidence of lambing especially after flushing. (fullstop)

TABLE 2. **Data of Conception and Lambing**

Different Criteria	Group A	Group B	Group C
Conception rate			
(1*st* insemination)	75.00%	52.94%	63.16%
(2*nd* insemination)	20.00%	41.18%	26.32%
(3*rd* insemination)	5.00%	5.88%	10.52%
Total ewes lambed	20	17	19
Lambs born alive	24	19	27
Lambs born dead	1	2	—
Total lambs %	125.00%	123.53%	142.22%
Calculated X^2 (CHI^2)	—	0.017n.s.	2.368 n.s.

The hypothesis was : that the total lambs % of group A was the expected value.
n.s. = Not significant.

REFERENCES

Able, B.V., Baker, B., Edgar, R.A. and Christians, C.J. (1964). Use of oral progesterone for the synchronization of estrus in the ewe. *J. Anim. Sci.* 23 (1) : 295.

Brunner, M.A., Hansel, W. and Hogue, D.E. (1964). Use of 6-Methyl-17-Acetoxy progesterone and pregnant mare serum to induce and synchronize estrus in ewes. *J. Anim. Sci.*, 23 (1) : 32.

Cunningham, J.M.M., Deas, D.W. and Fitzsimons, J. (1967). Synchronization of oestrus in ewes. *J. Vet. Rec.*, 80 : (20) 590-591.

Davies, H.L. (1960). Reduced fertility associated with the use of multiple injections of progesterone followed by pregnant mare serum. *Aust. Vet.* J., 36 : 20.

Denny, J.E.F.M., and Hunter, G.L. (1958). (Cited by Yeates, N.T.M., 1965 in "Modern Aspects of Animal Production" London Butterworths).

Dutt, R.H. (1953) : (Cited by Yeates, N.T.M., 1965 in "Modern Aspects of Animal Production" London Butterworths).

Dziuk, P.J. (1964) : Response of sheep and swine to treatments for control of ovulation. Conferece of Estrous Cycle Control in Domestic Animals, July 9-10, 1964, Linleon Nebr.

El-Alamy, M.A. and El-Hommosi, F.F. (1975) : A preliminary study on the artificial insemination of two strains of Egyptian sheep. (In Press).

Foord, H.E. (1966) : (Cited by Thomas R.J., 1967—Synchronization of oestrus in ewes. *Vet. Rec.* (2) 1967).

Ghanem, Y.S. (1964) : The effect of vitamin A deprivation on the reproductive performance of Merino and Barki ewes under desert conditions. Sezione 11-35 P. 284 V Congr.

Gordon, I., Caffrey, W. and Morrin, P. (1969) : Induction of early breeding in sheep following treatment with progestagen impregnated pessaries and P.M.S.G. *J. Dept. Agric.* Fesh. Repub. Ire. 66 212-31.

Haraszti, (1973) : Personal communication (Hungary).

Hinds, F.C., Dziuk, P.J. and Lewis, J.M. (1964): Control of estrus and lamting performance in cycling ewes fed 6-methyl-17-acetoxy progesterone (Cited by Dziuk P.J. 1964; Response of sheep and swine to treatments for control of ovulation. Confr. on Estrous Cycle Control 1964).

Howell, W.E. and Woolfitt, W.C. (1964) : Hormonal control of estrus and its effect on fertility in cycling ewes. Can. *J. Anim. Sci* 44 195-199.

Lamond, D.R. (1962) : Ostrus and ovulation following admi*S*istration of olacental gonadotrophins to Merino ewes. *Aust. J. Agr. Res.* 13 : 707.

Lees, J.L. (1966) : Variations in the time of onset of the breeding season in Clun ewes. *J. Agr. Sci.* Cab. 67 : 173-179.

Meaker, H.J. (1971) : Flushing and the lamb crop. Fmg. S. Afr. 47 (g) 15 - 19.

Oloufa, M.M. (1964) : Estrus synshronization in the Egyotian sheep. V° Congresso Internazionale per La Reproduzione Animale E La Fecondazione Artificiale, Trento 6-13 settembre 1964 Sezione II 3 P. 100.

Osman, A.M. and Baksai, E.H. (1970) : Investigation on urinary estrogen excertion from ewes with special reference to the clinical condition of the genital tract. 1. Estrous cycle. Zbl. *Vet. Med.* A 17 : 889.

Ostroumova, A.D. (1970) : Synchronization of oestrus in Romanov sheep. sb. nauch. Rab. Vses. naushno-issled. Inst. Zhivot. No. 21, 26.

Pretorius, P.S. (1967) : Hormonal induction of breeding activity in lacting Merino ewes and the value of vaginal smears in detecting induced oestrus. *S. Afr. Agr. Sci.* 10 : 883-889.

Quinlivan, T.D. and Robinson, T.J. (1967) : The number of spermatozoa in the fallopian tubes of ewes at intervals after artiücial insemination following SC-9889 immpregnated intravaginal sponges. In the control of ovarian cycle in the sheep Ed. T.J. Robinson Sydney University Press.

Roberts, E.M. and Edgar, D.G. (1966) : Triming of injection of pregnant mare's serum for the anoestrous breeding of ewes. Nature Lond. 212 : 1048 (Univ. New South Wales, Kensington, Australia).

Robertson, H.A. and Rakha, A.M. (1965) : Time of onset of oestrus in the ewe. J. Reprod. Fert 10 : 271-272.

Robinson, T.J. (1956). The artificial insemination of the Merino sheep following the synchronization of estrus and ovulation by progesterone injected alone and with PMS. *Aust. J. Agr. Sci.* 41 : 6-63.

Robinson, T.J. (1961) The time of ovulation and efficiency of fertilization following progesterone and PMS treatment in the cyclic ewe. J. Agr. Sci., 27 : 129.

Schalk, C. (1966): Oestrus synchronization in sheep. Tijdschr. Diergeneesk., 91 : 96.

Shevah, Y., Black, W.J.M. and Land, R.B. (1975): The effects of nutrition on the reproductive performance of Finn × Dorset ewes. II. Post-partum ovarian activity, conception and plasma concentration of progesterone and LH. *J. Reprod.* Fert., 45 : 289-299.

Thomas, R.J. (1967): Synchronization of oestrus in ewes. Vet. Rect. 80 (Printed by H.R. Grubb LTD. Croydon).

Torrell, D.T., Hume, I.D. and Weir, W.C. (1972): Effect of level of protein and energy during flushing on lambing performance of range ewes. *J. Anim. Sci.* 34 : 479.

Walker, P.T. (1972). Practical application of A.I. in conjunction with synchronization of heat cycle in the ewe. *Prac. Aust. Soc. Anim.* Prod. 9 : 171.

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