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Effect of Using Intravaginal Sponges of Domestic and Commercial Development on the Percentage of Synchronization of Estrus, Fertility and Prolificacy in Anestrous Ewes

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Abstract: The timing of seasonal anestric sheep is a very useful method in sheep production units, produces offspring in non-breeding season however, it is sometimes unaffordable for ovinocultor. The aim of this study was to evaluate the effect of using sponges domestic and commercial development on the percentage of estrus, fertility and prolificacy in anestrous ewes. A total of 60 sheep were used suffolk/hampshire seasonal anestrus, divided into three groups. Treatment 1 (T1), 25 sheep, each was fitted with an intravaginal sponge with 40 mg domestic production of progesterone, Treatment 2 (T2) with 25 sheep, they trade Intravaginal sponges with 20 mg of cronolone. In both treatments, the sponges were kept in the sheep for 12 days and they received 400 IU eCG intramuscularly 24 h before removing the sponges Witness Group (WG) with 10 sheep. The percentage of onset of estrus was different be tween groups (T1 = 72%, T2 = 92%, GT = 50%). As the fertility rate were observed but not very significant differences (T1 = 64%, T2 = 76% and GT = 50%). No differences in the percentage of litter in all treatments were single births. In conclusion, anestrous ewes treated with intravaginal sponges of domestic production are induced to estrus efficiently and showed an acceptable pregnancy rate compared with sponges commercial development, plus the cost of production is relatively low compared to existing products market, the use of intravaginal sponges domestic production is an economically viable for ovinocultor however, requires a higher dose of eCG to increase the lambing percentage.

Key words: Intravaginal sponges, anestrous ewes, synchronization, fertility, prolificacy, Mexico

INTRODUCTION

The progressive growth of human population, contrary to food production has forced men to seek new and better techniques in agricultural production to meet their basic nutritional needs.

In Mexico sheep production has increased significantly. However, the production of this species is very low and insufficient to meet the demands of consumption of meat from the national population. This necessitates the development and implementation of other reproductive technologies that raise the sheep population in relation to demand (Dogan *et al*., 2005; Anwar *et al*., 2008; Zieba *et al*., 2008).

One such technology is the synchronization of estrus which can lead to estrus at a number of sheep in

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order to impregnate a scheduled time in order to obtain up to three births in 2 years, this practice is induction effective when the sheep are out of breeding season therefore, it is widely used around the world. There are a variety of hormonal methods and products that are efficient and improve the domestic animal reproduction. However, in rural production systems with low technology, synchronization does not apply mainly by the low availability and high cost of products which is unaffordable for the small producer and the lack of methodology for the manufacture and application synchronization protocols (Dogan *et al*., 2005) so that the implementation of homemade techniques enable small producers to obtain low-cost benefits similar to those offered by commercial products.

Estrus synchronization can be accomplished by various methods, may be they natural or artificial (Creek *et al*., 2006; Forcada and Abecia, 2006; Anwar *et al*., 2008). The most commonly used artificial methods are the use of progestins with sponges impregnated with synthetic analogues of progesterone, Medroxyprogesterone Acetate (MAP) and Fluorogestone Acetate (FGA). The foundation of this method is to produce an effect in animals similar to that produced naturally by progesterone that is an extension of the luteal phase and inhibiting the action of gonadotropins and thus of the final stages of maturation follicles. By withdrawing the sponge is aborted and progestagen administration thereby inhibiting gonadotropins because of this, the sheep are synchronized in a similar state of the estrous cycle, entering most of them in heat in a short period time (Iida *et al*., 2009; Medan *et al*., 2004; Gonzalez *et al*., 2001; Kohno *et al*., 2005).

The aim of this study was to evaluate the effect of using sponges domestic and commercial development on the percentage of estrus, fertility and prolificacy in sheep suffolk/hampshire anestrus.

MATERIALS AND METHODS

A total of 60 sheep were used Suffolk/Hampshire between 2 and 5 years old (2-4 births) divided into three groups: Treatment 1 (T1), 25 sheep with intravaginal sponges impregnated domestic development with 40 mg of progesterone for 12 days plus 400 IU eCG intramuscularly 24 h before removing the sponge. Treatment 2 (T2) 25 sheep with intravaginal sponge impregnated with commercial processing cronolone 20 mg for 12 days plus 400 IU eCG intramuscularly 24 h before sponge removal.

Witness Group (GT) (10 sheep): For the detection of estrus, ewes were divided into three pens with 20 animals, each with a stallion for a whole set, mark and meet the sheep. Detection was carried out by direct observation (6:00-11:00 am and 3:00-8:00 pm) for 3 days starting 24 h after sponge removal.

Pregnancy diagnosis was determined by observing the non-return to estrus 15-18 days after mating. The variables were: Estrus rate (Percentage of animals that allowed the mounted within the period of estrus detection on total treated females), fertility rate (Number of sheep will not repeat among the total treated sheep) and percentage of prolificacy (Percentage of ewes that lambed 1, 2 or 3 children on total ewes).

Domestic manufacture of the sponges: The sponge was cut (trim) in equal circles 4 cm in diameter with a punch of copper, each pierced with 60 cm of cotton thread with a needle over and back. After passing through the sponge is knotted threads by introducing sterilized in boiling water for 15 min and then began to drain. Each of the dry sponge was placed in each compartment of an ice cube mold and were given 40 mg of progesterone sponge, allowed to stand for 60 min and was placed 1 mL of enrofloxacin at 5% then covered with a new bag.

Placement of intravaginal sponges: Before placing the sponges in the vagina in females, the vulva was washed using soap and water was introduced intravaginal sponge taking it with gloves on the beveled end of the applicator, making sure that the thread stay out, the rod was placed inside applicator to make contact with the sponge applicator moistened externally with petroleum jelly, the skin and stem were introduced to the bottom of the vagina, pulling the applicator 3-4 cm keeping the stem in place to release the sponge, both were removed, leaving the wires out for later recall. Each sheep was recorded and identified with the type of treatment given.

Application of eCG: About 24 h before sponge removal, 400 IU was administered eCG intramuscularly to all sheep in both treatments.

Withdrawal of intravaginal sponges: About 12 days later he made the withdrawal of the sponges gently pulling the strings back, keeping a slight downward slope. The sponges of which came off the wires before retirement were carefully removed with sterile surgical forceps.

Detection of estrus: For the detection of estrus, ewes treated and control group were divided equally into three

pens with 20 animals each and a male to mount, mark and meet the sheep. Also, detected by direct observation at a time from 6:00-11:00 am and 3:00-8:00 pm beginning 24 h after sponge removal for 3 days.

Pregnancy diagnosis: The diagnosis of pregnancy was determined by observing the non-return to estrus 15-18 days after mating.

Births: These were attended as many deliveries as possible, cleaning and reviving the breeding when so required.

Two pens were allocated covered from the weather for births which was introduced to farming with his mother for a week or until the lamb could follow in the pasture. The researchers recorded each of the deliveries.

RESULTS AND DISCUSSION

Estrus: As the percentage of estrus induction, this was 72% in the group of ewes treated with intravaginal sponges plus 400 IU domestic manufacturing eCG, compared to 92% in treatment with the commercial product while for the control group, the percentage was 50%. In all cases, estrus was present 24 h after sponge removal being the best part about 48 h (Table 1).

Fertility: It expressed as treated ewes on sheep showed the results in Table 2. The fertility rate obtained in this study was 64% for the group treated with home-made sponges and 76% for treatment with commercial sponges while for the control group the result was 50%.

Table 1: Presentation of estrus

	Treatments					
	T1		T2		GT	
Reporting times	N	%	N	%	N	%
24	2	8	0	0	2	20
48	11	44	14	56	3	30
72	5	20	9	36	0	0
Total	18	72	23	92	5	50

T1 = Home-made sponges, T2 = Commercial sponges, GT = Group Control, N = Number of animals

Table 2: Fertility results

	Treatments					
	T1		T2		GT	
Fertility	N	%	N	%	N	%
Sheep pregnants	16	64	19	76	5	50

T1 = Home-made sponges, T2 = Commercial sponges, GT = Group Control, N = Number of animals

Prolificacy: With regard to litter, there was no difference between animals treated with home-made sponges, commercial manufacturing and control group, all females had single births.

Economic viability: Assessing the economic viability of domestic manufacturing sponge was determined by comparing costs between the treatment and performed with commercial sponges (Table 3).

Cost analysis showed major economic differences, the cost per animal induced was higher for the commercial product (T2) at a cost of 91.60 pesos per ewe, the home-made sponge at a cost of 42.50 pesos, resulting in a 53.6% cheaper than commercially made sponge, even when the home-made sponge had an efficacy of 21.7% lower than commercially manufactured does not affect their profitability from the point of view, cost-effective.

The control of reproductive activity is a key management technique in modern sheep production units as possible to increase profitability. It enables better planning of activities such as feeding and mating times and calving, according to annual variations in market demand and resources. Consequently, increase fertility rates and births, the productivity of the system (number of channels/number of sheep casings) and obtaining higher quality products and more homogeneous.

The results of onset of estrus, found in this study (Table 1) agree with those reported by who indicated that the provision of more FGA PMSG induces the presence of estrus 36-72 h after implant removal in ewes Bergamacia FGA.

In the study by Estrada it was found that the use of domestic manufactured as sponge, indicated reproductive parameters, estrus and fertilization rate similar to those

Table 3: Comparison of both treatment costs

Treatments	Material	Cost pesos/Ewe
Commercial sponge	Sponge	64.00
	Applicator	12.00
	eCG	14.00
	Iodine	0.80
	Gauze	0.80
	Total	91.60
Home-made sponge	Upholstery foam	0.30
	Upholstery foam	0.20
	Aplicator	12.00
	Progesterone	10.80
	Enroxil	2.00
	Coolers	1.20
	Bags	0.40
	eCG	14.00
	Iodine	0.80
	Gauze	0.80
	Total	42.50

reported in studies where commercial sponges used to synchronize estrus in the research of these researchers with home-made sponges, obtained the withdrawal, a result of 79 and 58% estrus gestation. In the present study, home-made sponge was obtained as a result of 72% in estrus and 64% of gestation (Table 1 and 2), the latter being more favorable, even with the results of a lower percentage of estrus, to buy it with those who obtained the authors mentioned above.

In this study, there were no results in terms of prolificacy as all females, seen at work had singleton births. This differs from what is presented by Raso using sponges impregnated with Medroxyprogesterone Acetate (MAP) for 12 days plus 300 IU PMSG at sponge removal, obtained 14 offspring of 10 females. In this study was expected percentages of prolificacy but probably the body condition of animals was one of the excuses for these results.

CONCLUSION

In this study, the researchers can say that the timing of sheep suffolk/hampshire anestrus with home-made sponges is a highly effective method, useful, practical and economical, it is a chance for the breeder of sheep to the high cost that represents the synchronization commercial products thus, giving a greater number of offspring per year making it more profitable sheep production.

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