RESPONSE TO POLIOVULATORY (POV) TREATMENT, BY ULTRASOUND IN SUFFOLK BREED

Ştefan CIORNEI, Dan DRUGOCIU, Petru ROŞCA*, Liliana GHINEŢ (CIORNEI)
University of Agricultural Sciences and Veterinary Medicine, Faculty of Veterinary Medicine, Department of Reproduction, Aleea Sadoveanu 8, 700489-Iași, Romania
** Corresponding author: petru1065@yahoo.com*

Abstract
This study was done on a batch of Suffolk beef sheep, acclimatized in Romania.. The success of an ET protocol in sheep depends on many factors, but in the end, what matters is the number of embryos obtained. Embryo recovery (recovery rate), after poliovulation (POV), is an essential step in ET. The aim of our experiment was to observe the ovarian reaction (follicles –F, and corpora lutea-CL) to the treatment of Suffolk sheep polyovulation, The aim of our experiment was to observe the ovarian reaction to the treatment of Suffolk sheep POV. A number of 3 Suffolk sheep were poliovulated at the reproductive season, using P4-FSH-PGF protocol. The POV method was based on the administration of sponges with intravaginal progesterone 12 days, followed by 500 IU FSH: LHp in decreasing doses in the last 4 days, and a PGF on day 11. The poliovulatory ovarian response was monitored by transectal ultrasound, before estrus was detected, and on the day 7. The ovulatory response following POV treatment was assessed by CL counting. In two out of three sheep, CL was identified, despite the fact that they all had follicular growth, in sheep no. 2, no dehiscence occurred. The total number of formations observed was 26 CL. The distribution of CL between the two right and left ovaries, in the three cases examined was thus 8 CL on the right ovary and 7 CL on the left (in sheep 1), no CL in sheep 2 and 6/5 in sheep no. 3. The POV response to FSH in the Suffolk breed was an average of 8.6 F/sheep of the developed follicles. Our goal was in fact to follow the ovarian dynamics in these meat breeds, in order to apply the best treatment schemes, for successfully apply embryo transfer.
Keywords: *meat sheep, Poliovulation, MOET, embryo transfer*

Introduction

Small ruminant ET is a well described and yet underexploited animal breeding technology. The size of sheep, aspects of their anatomy and seasonal reproductive behaviour, present challenges not common to cattle. Those considerations have not deterred serious breeders and ET practitioners in sheep producing countries

Reproductive activity in sheep is characterized by a seasonality influenced by several factors such as photoperiod, latitude, temperature, nutrition and breed.

In sheep, some anatomical peculiarities limit the application of traditional reproductive biotechnology used in cattle.

Sheep estrus cycle has 17 days on average and can vary from 14 to 19 days. The estrous cycle is divided into a follicular phase for two to three days and luteal phase of 14 to 15 days. Small ruminants are reproductively seasonal species.

Biotechnology of Embryo Transfer is applied to females of superior genotic and aims to increase the frequency of their genes by increasing their progeny. ET allows the transference of embryos from superior females (donors) to matrices with low genetic value (recipients) or embryo freezing for later use.

Obtaining embryos is influenced by the development dynamics of the ovarian follicles, but also by their ovulation (Hafez ESE 2008).

Response to super-ovulation: approximately 25% of programmed donors will not respond to super-ovulation treatments. Some never respond, some may respond on a subsequent program. If the donor responds, she may produce from 1 to over 30 embryos, with average 8 to 12 depending on the breed, time of year, condition of animal (Ahmed and Derar 2015).

Our goal was in fact to follow the ovarian dynamics in these meat breeds, in order to apply the best treatment schemes, in order to successfully apply embryo transfer.

Materials and Methods

The present study was conducted during normal seasonal breed (autumn) in the N-Eastern region of Romania. This period is accepted as it represents the onset of the natural breeding season of smal ruminants, in this time the ovarian activity are vary intense.

Selection of the ewes was performed after breeding offspring, and after a complete clinical and gynecological examination.

Many combinations of treatments for the purposes of embryo collection and transfer are available. Estrus can be synchronized by the administration of progestagens such as progesterone

All groups received an intravaginal sponge (Chronogest, Intervet) containing 30 mg fluorogestone acetate (FGA) for 12 days. A number of 3 Suffolk sheep were poliovulated at the reproductive season, using P4-FSH-PGF protocol. The POV method was based on the administration of sponges with intravaginal progesterone 12 days, followed by 500 IU FSH: LHp in decreasing doses in the last 4 days, and a PGF on day 11.

Through ultrasound monitoring, the ovarian evolution can be observed in the dynamics. The endorectal technique is much more effective compared to the transabdominal one.

Result and discutions

In two out of three sheep, CL was identified, despite the fact that they all had follicular growth, in sheep no. 2, no dehiscence occurred. The total number of formations observed was 26 CL. The distribution of CL between the two right and left ovaries, in the three cases examined was thus 8 CL on the right ovary and 7 CL on the left (in sheep 1), no CL in sheep 2 and 6/5 in sheep no. 3. The POV response to FSH in the Suffolk breed was an average of 8.6 F/sheep of the developed follicles.

Many combinations of treatments for the purposes of embryo collection and transfer are available. Estrus can be synchronized by the administration of progestagens such as progesterone implants or synthetic progestins (flurogestone acetate, FGA; medroxyprogesterone acetate, MAP) given either orally or by the insertion of a vaginal sponge. The most widely used synchronization device for goats is the control internal drug release progesterone implant which is inserted in the goat’s vagina using a special applicator. Most traditional schemes consist of a long progestagen (12‑18 days) treatment; recent protocols use a shorter progestagen treatment (5‑9 days) accompanied by a prostaglandin F2 α analogue injection.

For the induction of superovulation of donor sheep, pituitary extracts of follicle-stimulating hormone (FSH) and pregnant mare serum gonadotropin (PMSG) are the gonadotropins most used. Commercially available FSH products are: Pluset .

Several protocols can be used for superovulating sheep, most commonly the injection of multiple doses of FSH on the last 3 to 4 days of the progestagen treatment. Due to the short half-life of the FSH molecule, it is traditionally administered every 12 hours. One example is the twice-a-day injection of a series of decreasing doses of FSH (5, 5; 3, 3; and 2, 2mg per injection), with a total dose of 20mg, with the next to last injection accompanied by progesterone removal and an injection of 150ug of a PGF2α analogue.

Fig 1. Ovarian follicle monitoring Transrectal ultrasound in sheep

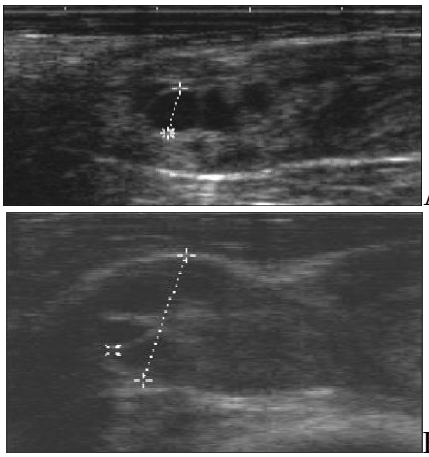

Fig 2. Evolutionary follicles from 3 to 9 mm, during poliovulation (A, B)

Fig 3. Monitoring multiple ovulation of the luteal body Transrectal ultrasound in sheep

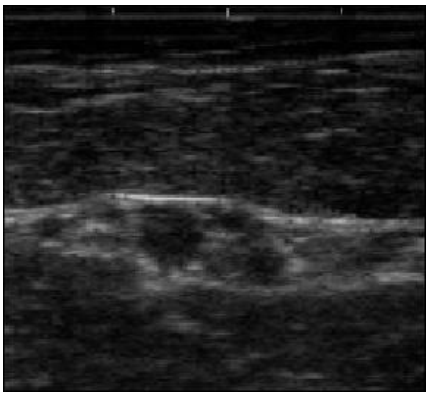

Fig 4. Identification of corpora lutea 6 days after their oestrus and counting

References

1. Alam MGS, Ghosh A, Mondal AK, Akbar MA 2001: Supplementation and puberty of zebu calves of Bangladesh. *The Bangladesh Veterinarian* 18 1-8.
2. Bari, F., Khalid, M., Haresign, W., Murray, a., Merrell, B., 2003. Factors affecting the 305 survival of sheep embryos after transfer within a MOET program. Theriogenology 306 59, 1265–1275. doi:10.1016/S0093-691X(02)01162-7
3. Ciornei Şt.G., Roşca P., Drugociu D., (2015) - Biotechnologies of inducing oestrus in sows using PG600. Journal of Biotechnology, Volume 208, Supplement, 20 August 2015, Pages S41, FI 3,34, doi:10.1016/j.jbiotec.2015.06.117,
4. HAFEZ, E.S.E. Studies on the breeding season and reproduction of the ewe. Journal of Agricultural Science, v.42, p.189-265, 1952.
5. Menchaca A, Vilarino M, Pinczak A, Kmid S, Saldana JM 2009: P4treatment, FSH plus eCG, GnRH administration, and day 0 Protocol for MOET programmes in sheep.*Theriogenology* 72 477-483.
6. Zeleke Mekuriaw- 2104, Neuro-endocrine control of reproduction in sheep, EIAR-DBARC-ICARDA-ILRI (LIVES)-FAO Training on Reproduction in Sheep and Goat