The Post-Partum Exfoliative Vaginal Cytology of Local Goats in Northern Algeria

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Abstract

The aim of our study was to determine the approximate length of the post-partum period of the local goat breed in Algeria. Based on the identification of cell layers of the vaginal mucosa (vaginal cytology) from the first week after parturition. In this work we used 13 goats aged 2 to 4 years and weighing 18 to 34kg live weight. The experimental study was conducted at the experimental farm of the agro-veterinarian faculty of the Blida University. By swab, vaginal smears were made for each goat twice a week to 2 or 3 days interval from the seventh day post partum to 80 days post partum. We realized 312 smears of vaginal mucosa in total (stained with My-Grunwald-Giemsa staining) and we identify the resumption of the post-partum sexual activity when the superficial epithelial cells predominate in the smears. In the light of our study, the average interval parturition-resumption of sexual activity in the local goat in northern Algeria is short, estimated at $21,45 \pm 3,56$ days with a variation ranging from 16 to 27 days.

Keywords: Local goat, post-partum, vaginal cytology

INTRODUCTION

The post partum anoestrus was considered to be the period between partum and the occurrence of the first estrus (Freitas *et al.*, 2004).

The postpartum period is defined as the period immediately following parturition and during which no normal estrus is manifested. With variable duration, it ends with the return of physiological and normal behavioral ovarian cycles.

The interval between parturition and the first post-partum estrus is an important trait which contributes to the productive efficiency (Greyling, 2000).

According Baril *et al.*, (1993), parturition is followed by a period of sexual rest for two reasons of internal origin. The first is the time required for uterine involution. The second is the inactivity of the ovary, mainly of central origin since this one is not sufficiently stimulated by gonadotrophin hormones.

The post-partum heat period in Black Bengal does vary within the different seasons (Fakruzzaman *et al.*, 2012).

The cytological changes in the vaginal epithelium of the Angora doe appeared to be influenced by cyclical ovarian activity and could be used to assess ovarian activity (Pretorius, 1977).

In our knowledge, no study has been published concerning the postpartum period of the Algerian local goat, so in this work, we try to determinate the post partum duration of the local goat in northern Algeria by the exam of vaginal exfoliative cytology changes.

MATERIALS AND METHODS

Thirteen local breed goats aged 2 to 4 years, weighing between 18 and 34 kg, are used in our experimentation that took place in the experimental farm of agro Veterinarian Faculty of the Blida University (Algeria). This Farm is located in the Mitidja region, having a Mediterranean

climate, characterized by cold and rainy winters, hot and dry summers. Animals are conducted in a semi extensive system and received 500g of concentrate per day per head. Water is distributed at will.

Our work is based on the identification of cell layers of the vaginal mucosa (vaginal cytology) from the first week after parturition. Vaginal smears were collected from each doe twice a week to 2 or 3 days interval from the 7th day post partum to the 80th day post partum. We realized in total, 312 smears.

The smear collection procedure involved using vaginoscope for parting the vulva lips and inserting a 10 cm long cotton-tipped sterile swab into the vagina to a depth of about 5–7 cm. The swab inside the vagina was rotated through 2–3 revolutions against the vaginal wall. The swab was withdrawn and rolled on a clean glass slide to form two parallel tracks of smear material on the glass surface. The smear was immediately fixed by (spray cytofixator), air-dried and stained by the Giemsa stain.

The vaginal cells are classified under a light microscope into three basic cell types with different cell diameters; as a superficial squamous cell with light cytoplasm, intermediate squamous cells and parabasal cells (Dudek, 2004). Each cell type was counted and then expressed as a percentage of totals (Lamond and Lang, 2005).

RESULTS AND DISCUSSION

To determine the first postpartum estrus we looked the first smear that contained the highest percentage of superficial epithelial cells for each

goat, this last indicates the resumption of sexual activity (Fig. 1).

In this study, it appears that post-partum sexual activity resumption, determined by vaginal cytology evaluation (smears with predominance of superficial epithelial cells) starts on the 16th day after parturition in the goat 5103. It starts on the 18th day, on the 19th day, on the 21st day, on the 22nd day, on the 26th day and on the 27th day, respectively for the goats 5104, (5100 and C116), (5101, 3070 and 104946), 7100, (89440 and 104997), 104906.

Contrarily, in the goats 5102 and 6100, the vaginal mucosa smears observation doesn't reveal a resumption of post-partum sexual activity (estrus or predominance of the superficial epithelial cells in the smears) throughout the study.

The moment of the sexual activity beginning (in days) after parturition, or the duration between parturition and the first estrus apparition determined by the exploration of the exfoliative vaginal cytology for the different goats is reported in the following table (Tab. 1).

The average duration of the post-partum sexual activity resumption (determined by vaginal cytology) was $21,45 \pm 3,56$ days. In the goats 6100 and 5102, we didn't identify smears with predominance of superficial cells during the length of the study, but the mostly presence of intermediate cells in large quantities.

These values are comparable to the results that have been reported by (Chemineau, 1983; Hafez and Hafez, 2000; Riera, 1982), postpartum intervals qualified short, 15 to 30 days are often noticed in goats. Mascarenhas *et al.*, (1995), reported that serrana Goats kidding in October had a significantly shorter postpartum anestrous

Fig. 1. Smears with predominate superficial epithelial cells.

period ($33 \pm 9,4$ days). Degefa *et al.*, (2006), found that the uterus reassumed normal non-gravid macroscopic and microscopic characteristics by day 19 post-partum in Balady goats. While Grayling and van Niekerk (1991) noted the involution process of the uterus was macroscopically complete by approximately 28 days post-partum in the Boer goat.

The mean duration of the post-partum anoestrous period in the Boer goat is quoted as being $55,5 \pm 24,9$ days with the period being $53,2 \pm 14,3$ days for does bearing singletons, $58,5 \pm 30$ days for does with twins and $61,7 \pm 30,7$ days for does bearing triplets (no significant difference) (Greyling, 1988). Chemineau (1983) reported that most Creole goats become cyclic 70 days post-partum, with a first post-partum estrous period being $21,05 \pm 8,9$ days following parturition.

The post-partum heat period in Black Bengal does vary within the different seasons. The post-partum heat period of does is comparatively higher in winter ($94 \pm 2,31$ days) than those of summer ($83,33 \pm 2,03$ days) and rainy season ($76,33 \pm 6,36$ days) (Fakruzzaman *et al.*, 2012). The length of post-partum anoestrus can vary substantially in tropical climate goats and food availability is the main environmental factor that determines the length of post-partum anoestrus (Gonzalez-Stagnaro, 1984). The authors concluded that

season of partum have a major influence on the time of sexual activity reinitiating after partum (Freitas *et al.*, 2004). The interval whelping-first heat is strongly influenced by the time of parturition. The interval can be short 5 to 6 weeks or longer 27 weeks for certain breeds. When parturition occurs during the period of sexual activity, the ovarian activity can resume and goats can conceive (Jainudeen *et al.*, 2000).

In the goat 6100 and the goat 5102, we have not seen estrus resumption by vaginal cytology (predominance of superficial cells in the smears). This could be due to the presence of silent ovulations unaccompanied by estrous behaviors, which are described in the goats by Delgadillo *et al.*, (1997), in tropical or subtropical regions, and Corteel and Cognié (1985) in temperate regions. Darquaoui and Elkhaldi (1992) found that the proportion of goats that had ovarian activity was still higher than that of subjects who showed signs of heat. This characteristic indicates the existence of ovulations unaccompanied with heat. The incidence of silent ovulations (15-25%) was relatively high in D'man breed goat in Morocco. Work performed on Creole goats by the progesterone assay show that the first postpartum ovulation not accompanied by estrous behavior can be noted in the third week after the whelping (Baril *et al.*, 1993).

Tab. 1. Resumption of sexual activity after parturition determined by analysis of vaginal cytology smears.

Goat number	Age (months)	Day of the first estrus apparition (superficial cells predominate in the smear)
5101	72	21
6100	28	ND
5102	24	ND
C116	66	19
3070	45	21
104946	58	21
89440	38	26
5103	24	16
104906	36	27
7100	60	22
5100	58	19
5104	54	18
104997	46	26
Mean $\pm$ S.E.M		21,45 $\pm$ 3,56

ND: Not determined (There is not estrus throughout the study).

CONCLUSION

In the light of our study, the mean interval parturition-resumption of sexual activity in the local goat in northern Algeria determined by analysis of vaginal cytology smears is short estimated at $21,45 \pm 3,56$ days. Other works are needed to study and characterize the different reproductive and productive parameters of local goats in Algeria.

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