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EFFECT OF NATURAL SUCKLING ON POSTPARTUM REPRODUCTIVE PERFORMANCE OF NUBIAN GOATS

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المستخلص

أجريت هذه الدراسة لمعرفة أثر الرضاعة الطبيعية على الأداء التناسلي للماعز النوبي. اختير عدد 20 معزة نوبية متعددة الولادات وقسمت عشوائياً حسب الوزن والعمر إلى مجموعتين متساويتين.المجموعة (أ) أرضعت مواليدها لمدة 13 أسبوع بينما المجموعة(ب) (الشاهد) تمت رعاية مواليدها اصطناعياً لنفس المدة. أوضحت النتائج أن متوسط فترة اللاشبق بعد الولادة كانت (21.5±57.8) يوم مقارنة بـ(4.4±20.4) يوم للمجموعتين على التوالي وكان الفرق عالي المعنوية (P<0.001) وكانت فترة الشبق أقصر في المجموعة (أ) مقارنة بالمجموعة (ب) حيث بلغت (3.04±29.89) مقابل (6.42±31.89) ساعة على التوالي. بلغت فترة الحمل في المجموعتين (5.4±152.3) و(3.9±151) يوم علي التوالي وقد كان عدد المواليد في كل من المجموعتين متشابهاً (1.75 ± 0.71) و (1.7± 0.5) وقد بلغت الفترة بين الولادتين (25.6±210.1) يوم مقابل (7.2±171.4) يوم للمجموعتين علي التوالي مما يوضح أن المعاملة لها تأثيراً معنوياًعالياً (P<0.001). بلغت معدلات الحمل (80%) و(100%) بالنسبة للمجموعتين (أ) و (ب) على التوالي بينما كان معدل الولادة 100% لكل مجموعة.

Abstract

This study was conducted to investigate the effect of natural suckling on reproductive performance of Nubian Goats. The study involved 20 multiparous Nubian goats allocated randomly according to body weight and age to two equal groups of 10 does each. Group A suckled their kids for 13 weeks while group B (control) kids were reared artificially by bottle for 13 weeks. The results showed that the mean postpartum anoestrus interval (PPAI) length was 57.8±21.5 days compared to 20.4± 4.4 days in the two groups respectively. The results indicated a high significant difference (P<0.001) in favor of the suckled group. The duration of oestrus in group A was shorter than that in group B with values of 29.89± 3.04 versus 31.89 ± 6.42 hrs, respectively. The gestation length in the two groups was 152.3 ± 5.4 and 151 ± 3.9 days. The litter size in the two groups was similar 1.75 ± 0.71 and 1.7 ± 0.5. The kidding interval was highly significantly (P<0.001) affected by the treatment. The recorded values were 210.1± 25.6 versus 171.4 ± 7.2 days for group A and B, respectively. The

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conception rates in the two groups were 80% and 100% (P>0.05) while the kidding percentage for both group was similar with a value of 100% for each group.

Keywords: Nubian goats; Suckling; Postpartum; Reproductive performance.

Introduction

Interest in the value of goats as domestic livestock is presently wide spread. Moreover, it has been stimulated by a wide recognition of their role in food production. Their economic importance in the tropics and subtropics where they are concentrated (Devendra, 1985). The Nubian goats is a distinctive type and although it originated in the Sudan, it is widely distributed in many part of Africa (Devendra and McLeroy, 1982)**.** Reproduction is a major factor contributing to the efficiency of meat and milk production by influencing the number of surplus animals and contributing to current and future flock production (Shelton, 1978). Oestrus is a periodical sexual excitement in females brought about by the ovarian activities under the control of anterior pituitary gland hormones (Laing, 1979). The postpartum anoestrus interval is the time between parturition and the recommencement of cyclic ovarian activity and regular oestrus cycles (Abebe, 2006). Nutrition of the doe and suckling are perhaps the most important factors that are known to delay resumption of normal ovarian cycles (Abebe, 2006).Thus suckling is one of the major factors that determine the length of P.P oestrus in dairy animals (Acosta *et al* ., 1983). Duration of oestrus periods is estimated as the interval between first and last coitus (Liewelyn *et al* .,1995). It is brought about by estrogen, the female excitatory hormone. The duration of oestrus in goats is usually 20-40 hours and 18-30 hours in young does. It may last for 48 hours (Hafez and Hafez, 2000).The gestation period is the elapse of time from fertilization of one or more ova after successful mating till parturition. It was studied in several breeds of goats in the tropics with an average of 146 days with range of 144 to 153 days (Devendra and McLeroy, 1987). Litter size is a combination of ovulation rate and embryo survival. The incidence of multiple births is common among most population of goats (Abebe, 2006).Kidding interval is the period between two consecutive kiddings and is composed of the service period (from kidding to conception) and the gestation period (Oppong, 1965). It is affected by breed of goats and some environmental factors (Devendra and Burns, 1970). The objective of this study was to illustrate the effect of suckling on resumption of postpartum ovarian cyclicity and subsequent reproductive performance of goats.

Materials and Methods

Study site: This experiment was conducted at the Small Ruminant Department (SRD) affliated to the Animal Production Research Centre (APRC) , Kuku , Khartoum North .

Animals and accommodation: Twenty seven multiparous Sudan Nubian goats were purchased from livestock market of Al Damar city, River Nile state. On arrival each individual animal was identified by ear tag and treated against internal and external parasites. From the above flock, 20 mature goats were selected and divided according to weight and age into two groups of 10 does each. The two groups were housed in separate pens, supplied with water troughs and feed mangers. Both groups were allowed to feed on concentrate ration and *Medicago sativa (*barseem) adlibitum once a day throughout the experimental period.

Management: The two groups were divided at random to the following treatments:

GroupA suckled their kids for 13 weeks (each animal suckling single kid).

GroupB(control) non-suckling and their kids were reared artificially by bottle for 13 weeks. The data was collected after kidding and continued up to the following parturition.

Data Collection:

Postpartum Oestrus Occurrence: Amature healthy buck was introduced to each group18-20 days post kidding for oestrus detection.

Service: Natural mating was adopted for breeding and the buck was allowed to serve any oestrum female.

Fertility Indices: Fertility indices including conception rates, litter size and kidding percentage were calculated for both groups.

Statistical analysis: The obtained data were subjected to statistical analysis. T-test was used for the quantitative traits and chi-square was used for the qualitative trait (conception rates) (Stat Soft, 2001).

Results

The data indicating the effect of suckling on the reproductive traits studied is presented in table 1.The results highlighted that suckling had exerted highly significant effect on both postpartum anoestrus interval (PPAI) and kidding interval. The PPAI in the suckled group was longer ($P < 0.001$) than in the non suckled group with value of 57.8±21.5 versus 20.4±4.4 days, respectively. Similarly the kidding intervals in the two groups were 210.1±25.6 and 171.4±7.2 days infavour of the non suckled group .The other tested traits (oestrus duration, gestation length and littersize) were not affected by the treatment. The result on the impact of suckling on conception rate is portrayed in table 2.The data indicated non significant effect of the treatment. The non suckled group however manifested higher value for the conception rate, where all the does were pregnant (100%) compared to the suckled group (80%). The kidding rate was

similar in both group with avalue of 100 % for each group indicating that non of the does in the two groups had experienced abortion.

Table 1: Effect of Natural suckling on reproductive traits of Nubian does.

Parameters	**Suckled group (A)**	**Nonsuckled group (B)**		**S.L**
Postpartum anoestrus interval (PPAI) /days	57.8±21.5	20.4±4.4		***
Duration of oestrus / hrs	29.89±3.04	31.89±6.42		NS
Gestation length/ days	152.3±5.4	151±3.9		NS
Kidding interval /days	210.1±25.6	171.4±7.2		***
Litter size/kids/doe	1.75±0.71	1.7±0.5		NS

******* means are significantly different ($P < 0.001$)
NS= Means on the same row are not different ($P > 0.05$)
S.L= Significant level.

Table 2: Effect of Suckling on conception rate.

	A	B	Chi-square	P	S.L
No. of experimental Does	10	10			
No. of Does Conceived	8	10			
Conception rate %	80	100	2.222	0.136	NS

NS= Not significant difference ($P > 0.05$)

Discussion

The mean PPAI in the present work for the suckled group 57.8 days is comparable with the data reported by Boly *et al* . (1993) in west African dwarf (*Moshi variety*) ewes and Greling (2000) for Boer goats. Both authorities reported 56± 0.95and 55.5 days as PPAI , respectively. Other data in the literature claimed longer PPAI. Abebe (1996) reported 92 days for (Somali) goats in Ethiopia and Ruvuna *et al*. (1987) reported amean of 68.1and 76.7 days for East African and Galla does, respectively. PPAI is influenced by several factors including season, lactation, suckling intensity, nutrition and breed (Nett, 1987). The discrepancy between the present study and the previous studies regarding PPAI could be justified by the fore mentioned factors. The PPAI in the non suckled group was significantly ($P<0.001$) shorter than those in the suckled group suggesting that sucking through hormonal effects had extended the PPAI. Abebe (2006) reported that suckling was claimed to delay resumption of postpartum oestrus thus extending the PPAI. Bearden and Joe (1972) authenticated that suckling favours acontinious flow of prolactin which acts selectively on FSH receptor sites in the ovary and thus inhibiting response of ovarian follicles to FSH thus delaing oestrus initiation. In the present work however no attempt was taken to monitor the hormonal profile during suckling. Moreover, it was well established in the literature that in human mothers breast nursing of babies is one of the natural methods of

contraception. The mean oestrus duration recorded in this study for group A (29.89 hrs) was similar to that reported by Lehloenya *et al*. (2005) of Nguni goats in south Africa and Teleb *et al*.(2003) in Damascus goats suckled for 60 days. Also the mean oestrus duration of group B (31.89 hrs) which was close to that recorded by Teleb *et al*. (2003) in Damascus goats suckled for 120 days. The gestation length was 152.3 and 151 days for group A and B, respectively. This finding comply with the results reported by Agrwal *et al*. (1992).Whereas the results are not in line with what was reported by Lehloenya *et al*. (2005), Teleb *et al*.(2003) and Abdalla (2003). The difference may be due to breed and genotype of the foetus. The kidding interval for the experimental goats was 210.1 and 171.4 days for group A and B, respectively. Group A had significantly ($P< 0.001$) longer kidding interval than that of group B. This may be referred to the effect of suckling on postpartum ovarian cyclicity. Since suckling is known to delay rebreeding and prolongs kidding interval. This results however disagree with that found by Abdalla (2003) and Khalid (2002). The variation of kidding intervals in goats can be attributed to the breed, season and other environmental factors. The Litter size recorded was 1.75 and 1.7 for group A and B, respectively with no significant ($P> 0.05$) difference. This finding was not comparable to that recorded by Abebe (2006), Lehloenya *et al*. (2005) and Teleb *et al*. (2003).The discrepancy can be attributed to the breed, age of doe, nutrition and season of kidding. The conception rates were 80 and 100% for group A and B, respectively with no significant ($P> 0.05$) difference between the treatments. In this study conception rate for group A was 80% which comply with that found by Teleb *et al*. (2003) . On the other hand, the conception rates were higher than the values obtained by Leholenya *et al*. (2005) and Mellado *et al*.(2004) . The difference could be attributed to the nutrition , age and season of mating .Kidding percentage was similar in both group with a value of 100% for each group. This finding comply with the result recorded by Elbashir (2010) who reported that, kidding percentage was 100% for Nilotic goats fed on molasses and sorghum based diets.

Conclusion:

This study concludes that the natural suckling process is one of the factors that inhibits reproductive function of the animal. Since it influences the resumption of ovarian activity and ovulation following parturition. Whereby it delays rebreeding and prolongs kidding interval.

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