

Zagazig Veterinary Journal

Volume 26
Number 2

1998

Confirmation Of Sexual Behaviour During Post-partum Period In Female Zariabi Goats Using Luteinizing Hormone

*Abou-El-Roos, M.E.A. and **H. Abdel-Maksoud,

* Department of theriogenology and Biochemistry**, Faculty of Veterinary Medicine, (Mosh-tohor), Zagazig University, Benha branch

ABSTRACT

The present work was conducted on 10 females Zariabi goats to determine both the pattern of estrous behaviour and vaginal traits as well as the plasma LH concentration was measured. The present results revealed that, during the postpartum period the LH was low and its level dose not exceed 3.93 ± 0.11 ng/ml. The LH pulse frequency increased from 1.71 ± 0.13 ng/ml to 3.93 ± 0.14 ng/ml with no change in the pulse and frequency. Mean LH value rose from its basal level (1.71 ± 0.13 ng/ml) to 110.7 ± 1.70 ng/ml, 14 hours after the onset of estrus, which was 34.41 ± 3.91 hours in length and occurred 29.20 ± 1.70 days. The conception rate was 60%.

Does sought out the buck and displayed tail wagging, bleating and restlessness at the onset of estrus (time 0). Tail wagging but not bleating or restlessness, also increased with the doe actively sought out the buck. Vulval redness, swelling and onset of a clear thin vaginal discharge were observed maximally on day 0. It was concluded that onset of frequency tail wagging was the most useful trait for detecting onset of oestrus together with the increased amount of LH.

INTRODUCTION

The endocrine basis of ovarian acyclicity after parturition is not well understood. Release of luteinizing hormone (LH) in response to gonadotropin releasing hormone (GnRH) is diminished during early post-partum period and does not return to the pre-pregnancy level until 16 to 25 days in women (1), 10 days in dairy cows (2). This diminished response may be due to decreased quantity of LH in the pituitary (3). The concentration of LH in the pituitary is low one day after parturition and increases thereafter (4). The content of LH in the pituitary of the pregnant ewe has decreased by 60% at day 50 of pregnancy and continues to decline throughout the remainder of gestation. Other factors that could also contribute to this decreased responsiveness to GnRH include insufficient concentrations of GnRH in the hypothalamas to maintain synthesis and or release of gonadotrophin. Accordingly one goal of this study was to determine the first ovarian activity after parturition, duration of oestrus and conception rate in zariabi goats, in addition to collect information on the changes which occur on LH after parturition and on timing behavioural and vaginal changes in relation to onset of oestrus and to assess which parameters might be useful in determining the onset of oestrus after parturition.

MATERIALS AND METHODS

Ten normal parturent, Zariabi goats, aged 20 - 30 months belonging to Tuhk Tanbisha village, Birket El Saab Monofia

governorate, were used in the present work. All females gave birth during the period from April to May 1996. They were apparently clinically normal and penned together in an open-ended barn. Goats were fed concentrate and hay and libitum, with free access to water. A buck was introduced for heat detection two times daily for 15 minutes. First post-partum oestrus, duration of heat and conception rate were recorded.

The aspects of oestrus behaviour exhibited by the doe indicated by seeking for the buck, tail wagging, frequent urination, bleating, restlessness and mounting other females. The changes in the vulval discharge, swelling and redness in relation to day of estrus were detected.

Blood samples were collected from all does into heparinized tubes every week for 28 days, beginning from the first day after kidding then during the first post-partum heat. From 0 day of estrus, blood samples were taken every two hours from the beginning till the end of estrus. A further blood samples were done 3-6 hours after the end of estrus and at 5 days later, plasma was separated by centrifugation and stored at -20°C and assayed for luteinizing hormone (5). Data obtained statistically analyzed according to(6).

RESULTS

The first post-partum heat was observed at 29.20 ± 1.70 days after parturition, the duration of heat was found to 34.41 ± 3.91 hours and the conception rate was 60%.

Regarding the oestrus behaviour, the does showed signs of interest in the buck from the onset of oestrus (time 0), this activity peaked at 0 hours, and remained high at the first 18 hours, when females continuously sought out and seeking the buck. Does displayed tail wagging, bleating and restlessness. Tail wagging was seen at time 0 in all does, whereas the incidence of restlessness and frequent bleating at time 0 was only 60%. Oestrus females, mounted other does with an incidence of 20% specially in the absence of buck (Fig. 1).

With respect to the variation in condition of vulva (Fig. 2) revealed that the vulval discharge occurred in a copious amounts on day 0, first day, and occasionally seen from second day to 6th day after the onset of oestrus.

The incidence of vulval redness and swelling were maximal on day 0 and then were sometimes seen on days one and two.

Fig. (3) showed that the mean values for the LH levels were 1.71 ± 0.11 , 2.634 ± 0.23 , 3.91 ± 0.43 , 3.93 ± 0.41 , 3.51 ± 0.31 and 3.78 ± 0.42 ng/ml during the first day post-partum, 7th, 14th, 21th, 28th and 0 day of oestrus respectively. Moreover, (Fig. 4) showed that the mean LH concentrations were 3.78 ± 0.42 ng/ml at 0. Day oestrus after that the LH levels took 8 hours to rise to 8.4 ± 1.37 ng/ml. Peak LH concentrations were 110.7 ± 10.6 ng/ml and occurred 14 hours from the onset of oestrous. LH reached to basal level again at 3-6 hours after the end of oestrus (1.2 ± 0.11 ng/ml). Moreover in diestrus it reached (1.3 ± 0.21 ng/ml).

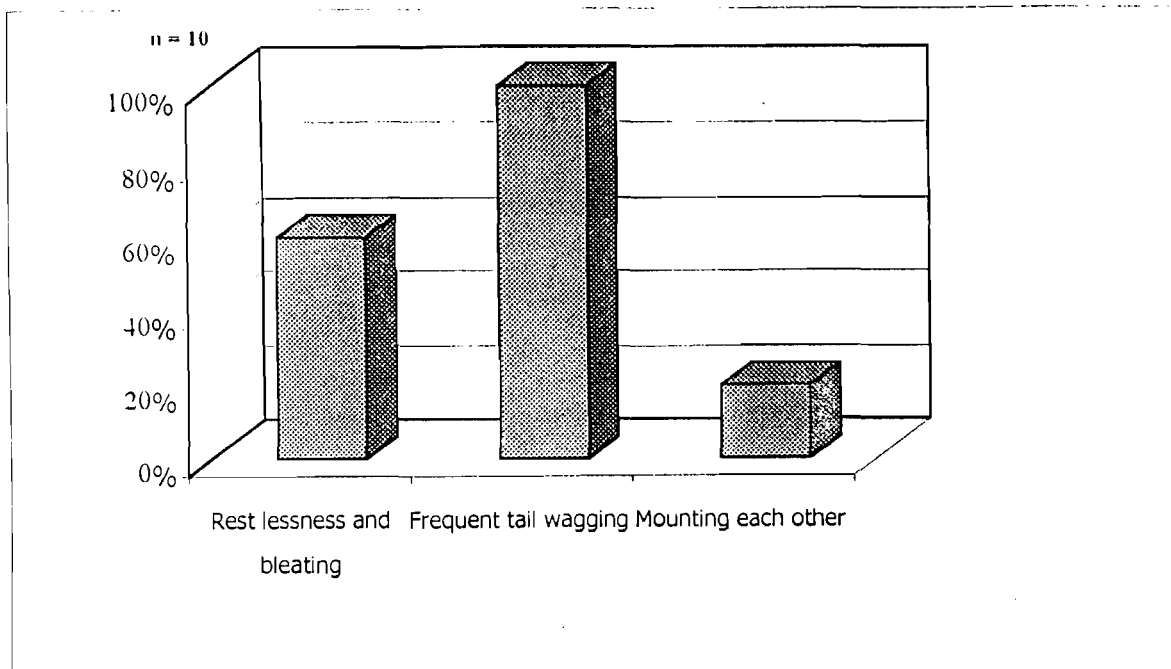


Fig. (1) : Incidence of female oestrus behaviour in zariabi goats (n =10).

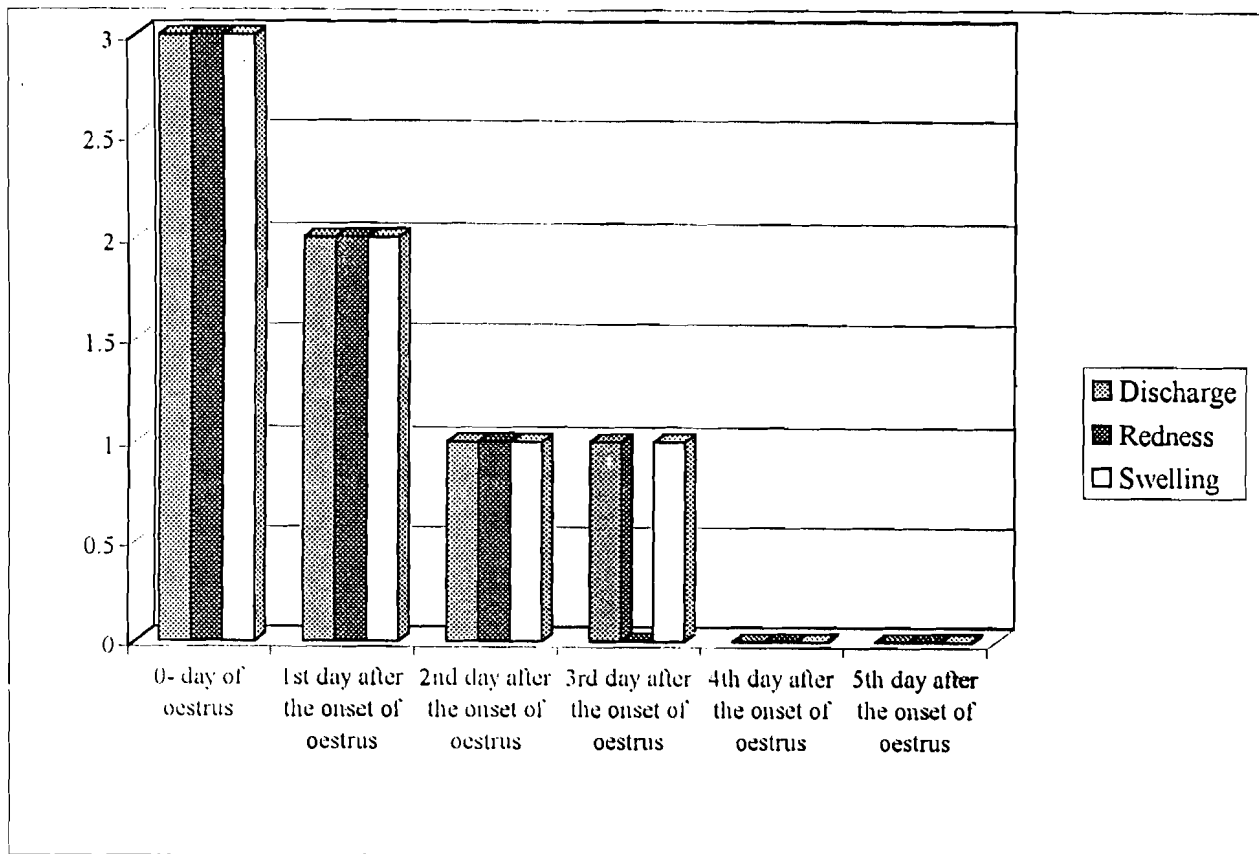


Fig. (2): The changes in vulval discharge, redness and swelling in relation to the day of oestrus (day 0).

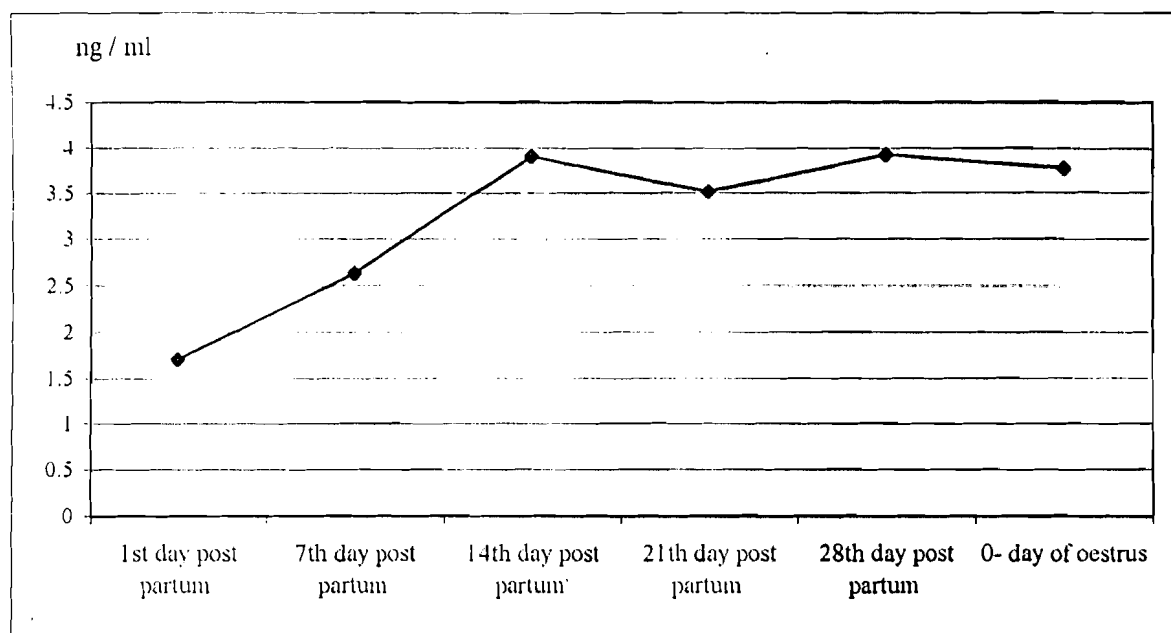


Fig. (3) : Relationship between post-partum period and plasma LH in zariabi goats till the onset of first post-partum oestrus (n =10).

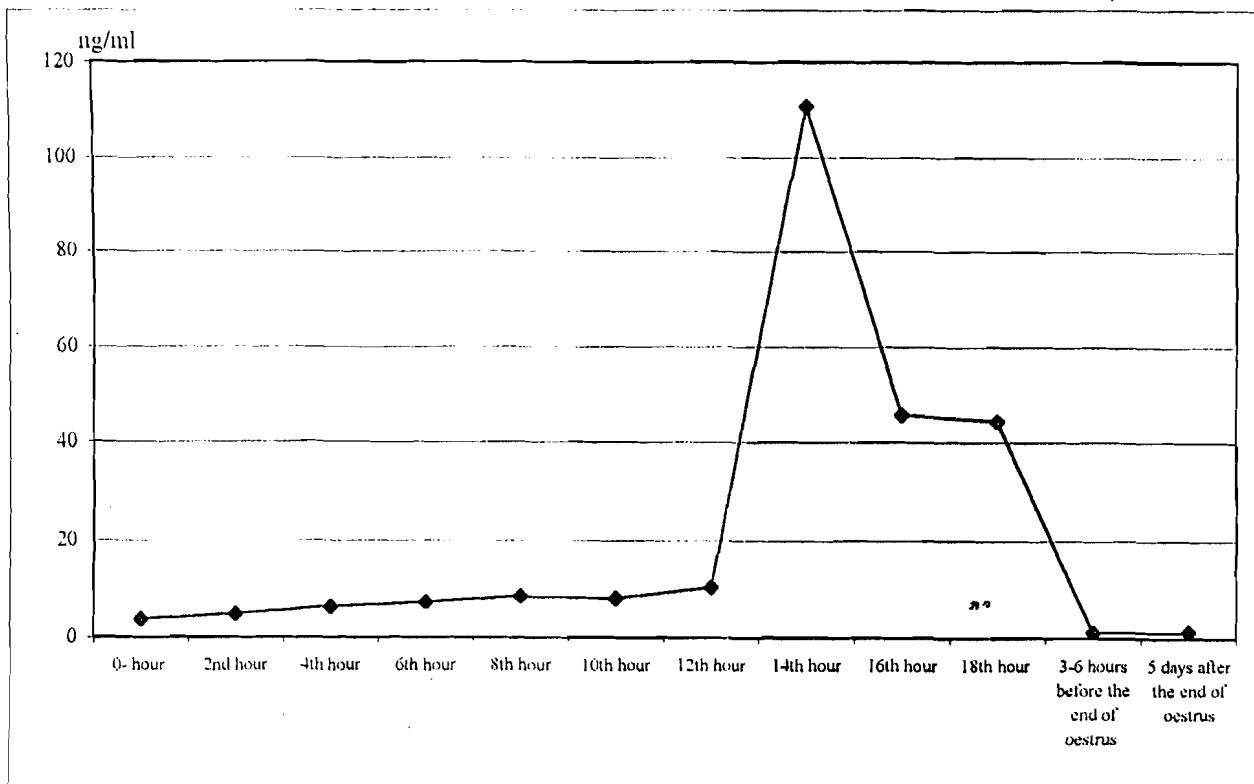


Fig. (4) : Relationship between oestrus and the surge of plasma LH in zariabia goats. bled every two hours throughout a naturally occurring oestrus (n =10).

DISCUSSION

In The present study, first post-kidding oestrus was determined at 29.20 ± 1.70 days after kidding. This result is in agreement with that reported previously in british and balady goats (7, 8) . While it was lower than that reported by other breeds of goats(9-15). This differences in the first post-kidding oestrus may be due to breed variations.

The mean duration of heat in the present investigation was 34.41 ± 3.91 hours seemed to be the same reported in balady goats (8) and is longer than that reported in other breeds (16, 17, 7). Some variation in oestrus duration may be due to synchronization with $PGF_2\alpha$ (18, 19), or administration of progesterone together with PMSG (20) which lengthens oestrus by about 6 hours compared with natural cycles. Environmental factors may also influence oestrus length(21) . In cows, oestrus duration is not related to endogenous concentrations of oestradiol -17 β (22) , but may be determined genetically by responsiveness of target receptors cells in the brain oestradiol (23) , thus explaining the wide variation in the period of sexual receptivity between breeds. The conception rate was 60% seemed to be lower

than reported (8) in balady goats 77.8% and this may be explained on breed variations.

The results showed that the various behavioural traits shown by the female, tail wagging was the most reliable indicator of oestrus. The pattern of tail wagging shown over the oestrus period most closely resembled that of the female seeking out the buck, and was seen in 100% of heats. Moreover, onset of frequent tail wagging was most closely associated with onset of oestrus. In contrast, bleating and restlessness were less pronounced and occurred at time 0 in 60% of the oestrus period. In cows, the frequency with various behavioural traits are shown during oestrus do not depend upon oestradiol concentration, but may be influenced by social factors (22). Thus, the incidence of bleating during oestrus is higher when bucks are absent. Similar findings were reported (24) . Oestrous does did mount other does, but the frequency was low and this activity was usually directed towards another oestrous doe. In such cases, mounting behaviour is an expression of dominance by the higher ranking female (25) .

The present results agree with those reported previously (26) who found clear thin discharges up until oestrus and cloudy, thicker

discharges thereafter. The present findings show that onset of a clear thin vaginal discharge was a good indicator of impending oestrus. Onset of acopious discharge was more closely confined to day 0. The discharges persisted for up to 3 days this could be due to oestrogen secretion by a new wave of developing follicles.

The incidence of vulval redness and swelling was maximum on the day of oestrus and subsided 2-3 days later. This results suggest that oestradiol receptor in the reproductive tract are more sensitive to rising oestradiol levels than the neural receptors which elicit oestrus behaviour (27).

Although there was a tendency for less LH to be released one day after parturition than on day 7th, 14th, 21th and 28th, no significant difference were noted during the post partum period studied. Similarly, the amount of LH released in response to GnRH was decreased during the last 4 weeks of pregnancy, but on day 14 and 28 postpartum, GnRH-induced release LH was not different from that of diestrous ewes (28). In a study the responsiveness to GnRH had not fully recovered by 6 week post partum (29, 30).

The amount of LH contained in the pituitary is highly correlated with GnRH induced release LH suggests that perhaps the pituitary is not refractory to GnRH, but simply does not contain enough LH to induce ovulation in the post partum period. Moreover, during pregnancy and postpartum, the quantity of LH released in response to GnRH is linearly related to pituitary content. In a study of pituitary cells isolated from post-partum ewes, (30) a constant percentage ($47.1 \pm 3.2\%$) of the LH contained in the cells was released in response to a maximally stimulatory dose of GnRH, that is, more LH was released later in postpartum anestrus because more LH was contained in the pituitary, not because the ability of gonadotrophs to cell respond to GnRH had changed. Thus decreased concentrations of LH in the pituitary may will contribute to adiminished release of LH in responsive to GnRH and both content and responsiveness may be involved in post partum anestrus (3). However, the GnRH responsiveness is not related to the incidence of or interval to the post partum estrus (28).

In the present study, the LH values showed a flactuations from the beginning till the end of oestrus. It reached peak

concentration (110.7 ± 10.61 ng/ml) 14 hours after the onset of oestrus. The peak LH heights from 54 to 114 ng/ml were reported (18, 31,7). In the present study, the interval from time of onset of oestrus to the LH peak was 14 hours, compared with 6-12 hours in other breeds (19, 20, 7).

It could be concluded that the increased LH levels together with frequent tail wagging is an important point of view for the starting of cyclicity after kidding in zariabi goats.

REFERENCES

- 1-Miyake, A.; O. Tanizawa, T. Anona and Kurachi (1978): Pituitary LH response to LHRH during puerperium. *Obstet. Gynecol.*, 51 : 37.
- 2-Fernandes, L.C.; W.W. Thatcher, C.J. Wilcox and E.P. Call (1978): LH release in response to GnRH during the postpartum period of dairy cows. *J. Anim. Sci.* 46: 443.
- 3-Moss, G.E.T.E. Adams, G.D. Niswender and T.M. Nert (1980): Effects of parturition and suckling on concentrations of pituitary gonadotrpins, hypothalamic GnRH and pituitary responsiveness to GnRH in ewes. *J. Anim. Sci.*, 50 : 496.
- 4-Chamley, W.A.; H.A. Jonas and R.A. Parr (1976): Content of LH, FSH, and growth hormone in the pituitaries of pegannt and anestrus sheep. *Endocrinology*, 98 : 1535.
- 5-Webb, R.; Baxter, G.; Preece, R.D.; Land, R.B. and Springbett, A.J. (1985): Control of gonadotrophin release in scottish black face and finnish landrace ewes during seasonal anoestrus. *J. Reprod. Fertil.*, 73, 369-78.
- 6-Spiegel, M.A. (1988): Statistical methods. Low State University Press, 59-61.
- 7-Llewelyn, C.A.; Perrie, .; Luckins, A.G. and Munro, C.D. (1993): Oestrus in the British white goat: timing of plasma luteinizing hormone surge and changes in behavioural and vaginal traits in relationship to onset of oestrus. *Br. Vet. J.* 149 : 171.
- 8-Abou-El-Roos, M.E.A. (1996): Some studies on the reproductive performance in balady goats. Ph. D. Thesis, Fac., Vet. Med., Zagazig Univ. (Benha branch).
- 9-Otchere, E.O. and Nimo, M.C. (1975): Observations on the reproductive behaviour in the west African dwarf goat. *Ghana J. Agric. Sci.*, 8, 187.
- 10-Carmenate, C. (1977): A study of some reproductive parameters in saanen and

- toggenburg goats. *Revista Cubana de Reproduccion Animal*, 3 (1), 13.
- 11-Bellaver, C.; Arruda, F. De A.V.; Moraes, E.A.D.C. (1980): Productivity of goats and sheep kidding and lambing in the dry season. Comunicado tecnico, EMBRAPA, J., 3 pp. (PT) centro Nacional de pesquisa de caprinos, Fazenda Tres lagoas, Estrada Groairas, Brazil.
- 12-Bhattacharyya, B.K.; Mazumder, N.; Mazumder, A. and Luktuke, S.N. (1981): Studies on certain aspects of oestrous behaviour in pashmina goats. *Ind. J. of An. Sci.*, 51 (1): 67 -69.
- 13-Prasad, S.P. and Pandey, M.D. (1982): Reproductive performance associated with rebreeding, oestrous duration, number of inseminations and season in Barbari nanny goats. *Ind. Vet. J.*, 59 (10) : 794-798.
- 14-Mazumder, N.K. and Mazumder, A. (1983): Breed characteristics of some Indian pashmina goats. *Ind. J. Ani. Sci.*, (53): 779 -782.
- 15-Mittal, J.P.; Chosh, P.K. and Sengar, O.P.S. (1983): A note on Marwari breed of goat. *J. of Vet. Physiol. And Applied Sci.*, 2 : 39-41; *A.B.A.* (52): 5872.
- 16-Sorrer, B.H. (1973): Some patterns of reproduction in goats. M.V. Sc. Thesis. *Vet. Med. Cairo University*.
- 17-Salem, L.A.; El-Hommosi, F.F.; Allam, F.M. and Salem, A.E. (1991): Seasonal variations in oestrous activity in goats under upper Egyptian conditions *Assiut Vet. Med. J.*, 26, (51) : 108 - 144.
- 18-Chemineau, P.; Gauthier, D.; Poirier, J.C. and Saumande, J. (1982): Plasma levels of LH, FSH, prolactin, oestradiol 17 β and progesterone during natural and induced oestrus in the dairy goats. *Theriogenology* 17, 313 -23.
- 19-Mori, Y. and Kano, Y. (1984): Changes in plasm concentrations of LH, progesterone and oestradiol in relation to the occurrence of lutealys is, oestrus and time of ovulation in the shiba goat (*capra hircus*). *J. Reprod. Fert.* 72, 223 -30.
- 20-Gerlying, J.P.C. and Van Niekerk, C.H. (1990): Ovulation in the Boer goat doe. *Small Rumin. Res.* 3, 457 -464.
- 21-Akusa, M.O. and Egbunike, G.N. (1990): Effects on ostrus duration of west African dwarf goats. *Small Rumin. Res.*3,413 -418.
- 22-Coe, B.L. and Allrich, R.D. (1989): Relationship between endogenous estradiol -17 β and estrous behaviour in heifers. *J. Anim. Sci.*, 67, 1546 -1551.
- 23-Glencross, R.C.; Esslemont, R.J.; Bryant, M.J. and Pope, G.S. (1981): Relationships between the incidence of pre-ovulatory behaviour and the concentrations of oestradiol -17 β and progesterone in bovine plasma. *Appl. Anim. Ethol.* 7, 141 -148.
- 24-Perera, B.M.A.; Bongso, T.A. and Abeynaike, P. (1978): Oestrous synchronization in goats using cloprostenol. *Vet. Rec.*, 102, 314.
- 25-Matthews, J.G. (1989) : Female infertility. *Goat Vet. J.*, 10, 79-88.
- 26-Pretorius, P.S. (1977): Vaginal cytological changes in the cycling and anoestrous Angora goat doe. *J. S. Afr. Vet. Ass.*, 48 :169-171
- 27-Carrick, M.J. and Shelton, J.N. (1969): Oestrogen -progesterone relationships in the induction of oestrus in spayed heifers. *J. Endocrinol.*, 45, 99 -109.
- 28-Wright, P.J., P.E. Geytenbeek, I.J. Clark and J.K. Findlay (1980): Pituitary responsiveness to LH-RH, the occurrence of oestradiol -17 β -induced LH-positive feed back and the resumption of oestrus cycles in ewes post -partum. *J. Reprod. Fertil.*, 60 -171.
- 29-Chamley, W.A.; J.K. Findlay, L.A. Cumming, J.M. Buckmaster and J.R. Goding (1974): Effect of pregnancy on LH response to synthetic of gonadotropin -releasing hormone in the ewe. *Endocrinology* 94 : 291.
- 30-Jenkin, G. and R.B. Heap nd D.B.A. Symons (1977): Pituitary responsiveness to synthetic LH -RH and pituitary LH content at various reproductive stages in the sheep. *J. Reprod. Fertil.*, 49 : 207.
- 31-Knight, G.H.; Wilde, C.J.; McLeod, B.J. and Haresign, W. (1990): Exogenous GnRH induces ovulation in seasonally anoestrous lactating goats (*capra hircus*). *J. Reprod. Fertil.* 83, 679 -686.

الملخص العربى

تأكيد السلوك الجنسى للماعز الزرايبي خلال فترة مابعد الولادة بواسطة تركيز الهرمون الليوتينى

محمود السيد عابد أبوالروس ، حسين عبدالمقصود على

قسمى التوليد والتناسل والتلقيح الاصطناعى والكيمياء الحيوية

كلية الطب البيطرى - جامعة الزقازيق - فرع بنها (مشتهر)

أستخدمت لهذه الدراسة ١٠ من إناث الماعز الزرايبي لتحديد نمط السلوك الجنسى والخواص المهبيلية بعد الولادة وكذلك قياس تركيز الهرمون الليوتينى . أظهرت الدراسة أن الهرمون الليوتينى كانت نسبته قليلة فى خلال فترة مابعد الولادة حيث لم تزد قراءته عن 393 ± 14 . نانو جرام /مللى بدون تغيير فى تذبذبه أو معدله فى حين ارتفعت نسبته من الحد الادنى (171 ± 13 . نانو جرام /مللى) إلى 1107 ± 6 نانو جرام /مللى فى الساعة الرابعة عشرة من بداية ظهور أول شبق بعد الولادة حيث كانت طول فترة الشبق 4341 ± 91 ساعة وكان حدوث أول شبق بعد 2920 ± 70 يوم بعد الولادة وكانت نسبة حدوث الاخصاب 60% .

وكذلك أظهرت الماعز اهتمام بالغ ناحية الذكر واطهرت هز الذيل باستمرار وأصدرت صيحات مميزة خصوصاً فى بداية الشبق وكذلك تم تحديد ان بداية الزيادة فى نسبة الهرمون الليوتينى بالاضافة الى هز الذيل باستمرار هو الخاصية المميزة جداً لتحديد بداية الشبق عن الخواص الاخرى .