

# **BLOOD PROGESTERONE AND ESTROGEN HORMONES LEVEL DURING PREGNANCY AND AFTER BIRTH IN IRAQI SHEEP AND GOAT**

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## **ABSTRACT**

Serum progesterone and estrogen concentrations were investigated during pregnancy and few days after birth. Blood samples were collected twice / month from 24 numbered animals ( 12ewes and 12 does) . serum was isolated and kept under - 20C untill hormonal analysis. Enzyme - Linked Immunosorbent assay (ELISA) using (ELISA Reader Dona 3200). Progesterone concentrations of pregnant ewes and does were showed steadily increased to reach  $24.9 \pm 2.5$  ng/ml and  $30.34 \pm 2.3$ ng/ml in ewes and does, during 4<sup>th</sup> month and declined to 0.6 and 2.5 ng/ ml after birth in ewes and does, respectively. Estrogen hormone levels in ewes were increased significantly during pregnancy to maximum  $98.7 \pm 4.3$ ng/ml by 5<sup>th</sup> month and sharply declined to  $4.1 \pm 0.06$  after birth. While in does estrogen level increased significantly and steadily to  $1150.6 \pm 6.23$  pg/ml during last month of pregnancy and to  $5.9 \pm 0.4$  pg/ml after birth. The present work indicated levels of progesterone hormone increased during 1<sup>st</sup> and 2<sup>nd</sup> months in ewes and does, while the significant increased from 3<sup>rd</sup> month on . Estrogen reach maximum concentrations during last month in doe Which higher about 11 times than that of ewes .It is useful means to diagnosis pregnancy of ewes and does by hormonal methods after mating 20-30 days.

## **INTRODUCTION**

Iraqi sheep and goats are seasonally poly estrous and thus can breed the year round (1 and 2). In seasonal breeders there are number of factors which either stimulate or suppress the breeding activity it was there for considered necessary to measure reproductive hormones in small ruminant at different time of the year to determine seasonal and pregnancy effects(3). This information is required in order to increase reproductive efficiencies (4). During the estrous cycle plasma progesterone concentration was found to be 9.3 ng/ml (5) , and vary between 2 and 18 ng/ ml(6) . Estradiol 17beta level were reported varied from 120- 720pg/ ml(6). While Kakous, et

al. (7) recorded that the ewes with twins had higher concentrations of both steroid hormones than ewes with single fetus. Plasma estradiol levels rose from 205 during first month to 554 pM/L by third month gestation until parturition (8). Roberts (9) reported the progesterone levels rise from 5 ng/ml to 33 ng/ml during 3<sup>rd</sup> months of pregnancy in doe. Also, progesterone was found to rise to 17 nM/L by second months and maximal level was 21 nM/L at last month of pregnancy (10). The present work is designed to examine the progesterone and estrogen concentrations in the blood of pregnant ewes and does and after birth.

## **MATERIALS AND METHODS**

This study was conducted in farm of college of Agriculture Sulaimani University and Vet. College, Baghdad University. Animals estrous were regular detection before inseminated. Maternal peripheral blood samples were collected twice/month from 24 multiparous (12 ewes and 12 does). Serum samples were separated by centrifugation. Samples were kept at -20 until hormonal analysis. Serum progesterone and estrogen concentrations were examined by Enzyme-Linked Immunosorbent assay (ELISA) using (ELIAS kits and Reader- Dana-3200). Progesterone measurements were recorded in ng/ml and pg/ml for estrogen concentrations. The least significant difference (LSD) was used to compare the significant differences between mean. SAS/STAT users guide for personal computers SAS.

## **RESULTS**

The hormones assay were pooled on a monthly basis. The tables (1&2) give progesterone and estrogen results in 24 adult ewes and does which were showing cyclic estrous and subsequently became pregnant and produced normal new borne. Table 1. revealed that the serum progesterone levels were significantly  $P < 0.01$  during the 4<sup>th</sup> month compared to that of first, second and after birth. While estrogen levels were showed significantly steadily increased during pregnancy and declined sharply after birth. In goats Table -2 shows that the serum progesterone levels had the same levels as in ewes but higher during third, fourth and fifth months of pregnancy as well as after birth. Estrogen hormone in does was steadily increased during pregnancy to reach  $1150.6 \pm 6.23$  pg / ml, which higher about 11 times than that of ewes, and declined after birth to  $5.89 \pm 0.4$  pg/ml.

**Table – 1. Serum progesterone ( ng/ml ), estrogen ( pg/ml ) hormones levels during pregnancy and after birth in ewes. X ± S.E. ( n=12 ).**

Hormone	Months					After birth	LSD
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>		
Progesterone	B 6.70 ± 1.01	B 7.75 ± 0.75	C 15.71 ± 1.53	D 24.91 ± 2.53	C 11.70 ± 1.23	A 0.6 ± 0.01	2.107
Estrogen	B 10.30 ± 1.37	C 47.57 ± 3.90	C 53.75 ± 5.04	D 74.33 ± 4.09	E 98.65 ± 4.29	A 4.10 ± 0.06	5.156

Different litters indicate a significant differences among columns ( P<0.01 ).

**Table – 2. Serum progesterone ( ng/ml ), estrogen ( pg/ml ) hormones levels during pregnancy and after birth in does. X ± S.E. ( n=12 ).**

Hormone	Months					After birth	LSD
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>		
Progesterone	B 8.10 ± 0.50	B 7.05 ± 0.71	C 19.30 ± 1.50	D 30.34 ± 2.32	C 20.72 ± 1.84	A 2.50 ± 0.21	3.52
Estrogen	B 71.13 ± 0.56	C 205.80 ± 2.01	D 330.98 ± 3.83	E 576.40 ± 5.71	F 1150.60 ± 6.23	A 5.89 ± 0.40	94.1

Different litters indicate a significant difference among columns ( P<0.01)

## DISCUSSION

Table.1. In ewes , Progesterone levels rise starting about day 50 of pregnancy , while placenta secretes little progesterone. The corpus luteum made a considerable to the total progesterone produced by the mother through a large part of gestation (11). However, the placenta could be make a major contribution to total progesterone production in the pregnant ewes (12), An increase in inactive 17 alpha , 20 alpha dihydroxy progesterone is reported at the time of progesterone falls (12). As well as, late in gestation placental permeability to steroid changes with advancing pregnancy (13 and 4) .Thorburn and Chollis (14) referred lower level of plasma progesterone during pregnancy in ewes, While (15 and 16)., also reported lower plasma progesterone concentrations in ewes than that reported in this work , While in goats they measured higher levels for estrogen during pregnancy. The levels of hormone

depend upon a variety of factors including breed , secretion, metabolic rate number of fetuses and assay system used.

Table 2. In goats maternal estrogen levels are higher than in sheep and increased steadily throughout pregnancy to the highest concentration during last month preceding delivery. In intact pregnant goats, maintenance of corpus luteum function depend on the maternal pituitary, and placental lutotrophin (3). A luteotrophic rate has been suggested for placental lactogen , which increase late in gestation (13). Similar estrogen blood concentrations observations was reported by (3). Banzer (16) concluded that The major maternal estrogen are esterone and estradiol 17 alpha which biological activity lower than estradiol 17 beta. Variable concentrations were reported about the blood progesterone and estrogen in pregnant sheep and goats .(17) and(18). Conclusion. It is useful means for early diagnosis of pregnancy in ewes and does that have not returned to estrous after mating.

### قياس مستوى هورموني البروجسترون والاستروجين خلال الحمل وبعد الولادة

#### مباشرة في الأغنام والمعز العراقي

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#### الخلاصة

يهدف البحث لقياس مستوى هرموني الحمل البروجسترون والاستروجين وبعد الولادة. جمع الدم من 24 رأس (12 نعجة و 12 معزة) مرتين في الشهر من كل حيوان . فصل وحفظ مصل الدم وتم قياس الهرمونات بطريقة Enzyme –linked immunosorbent assay(ELISA) وباستخدام (ELISA Reader Dona 3200) أعلى مستوى لهرمون البروجسترون كان في الشهر الرابع من الحمل  $24.9 \pm 2.53$  و  $30.34 \pm 2.23$  نانوغرام /مل في الأغنام والماعز علي التوالي . أما هرمون الاستروجين في الأغنام والماعز فكان يزداد بصورة تصاعدية ومعنوية خلال أشهر الحمل ليصل إلى أعلى مستوى له في الأغنام  $98.65 \pm 2.4$  والماعز  $1150.6 \pm 6.23$  بيكوغرام /مل خلال الشهر الأخير من الحمل . بعد الولادة ينخفض بصورة حادة بعد الولادة الى 0.6 و 2.5 نانوغرام /مل في الأغنام والماعز علي التوالي . أما هرمون البروجسترون يرتفع خلال الشهر الثاني والثالث ليصل إلى أعلى مستوى للأغنام والماعز خلال الشهر الرابع للحمل . هرمون الاستروجين في الماعز يزداد خلال الحمل تصاعديا ويصل أعلى مستوى قبل الولادة و يصل مستو الهرمون 11 مرة أكثر مما في النعاج . من المفيد تشخيص الحمل في الأغنام والماعز بقياس هرمونات البروجستون والاستروجين بعد التسفيد أو التلقيح ب 20-30 يوم. خلال أشهر الحمل

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