5- Summary

The present study was carried out during the period from September 2000 to May 2001 in farm animal production in Mashtoul, Sharkea province. Hormonal analysis and blood components carried out in Animal Physiology Unit, Nuclier Research Center, Atomic Energy Authority using the Radio-Immuno-Assay (RIA) technique.

Fourty two ewes (18 Ossimi and 24 Rahmani) aged 1.5 to 3.5 years were used. The study was done during pregnancy period and two months after parturition. Blood sampling were taken on 10,20,30,50,100,120,140 and 145 days of pregnancy period and during the post-partum period, blood samples were taken on the days 30 and 60 from parturition.

The study aimed to detrmine plasma estradiol-17β, progesterone, triiodothyronine and thyroxin during pregnancy and post partum periods. Also, plasma concentration of total protein (TP), albumin (A), globulin (G), A/G ratio, total lipids (L), cholesterol (C) and L/C ratio were detected during the same periods. The effect of breed, days of estimation / breed, parity number of ewes, sex and type of feti and regression on age and body weight of ewes also studied. The statistical analysis were taken by SAS programs 1996.

Results obtained could be summarized as follows:

1: pregnancy period:

1.1: pregnancy duration

- The mean of pregnancy duration decreased significantly (P<0.001) in Rahmani ewes (149.1 days) compared with Ossimi ewes (150.94 days).
- The gestation length was shorter (149.76 days) in ewes of the first parity compared with (150.89 days) in ewes of the second parity.
- Ewes having female feti had a longest (P<0.001) gestation length (151.04 days) while the short gestation length (149.05 days) in ewes having twins (male and female) feti.
- The pregnancy duration decreased significantly (P<0.001) in twins (150.01 days) compared with single feti (150.40 days).
- The regression coefficients of gestation length on both of age and body weight of ewe are statistically insignificant.

1:2: The hormonal pattern during pregnancy period:

1.2.1: Sexual hormone (E_2 and P_4):

1.2.1.1: Estradiol-17β (E_2):

- Plasma estradiol-17β in Ossimi decreased insignificantly (149.1 pg/dl) than in Rahmani ewes (158 pg/d).
- Great significant (P<0.001) variation was obtained in the values of plasma estradiol- 17β level during pregnancy period.
- Estradiol- 17β increased significantly (P<0.001) in 3rd parity 259.85 pg/dl compared with other parities, while, the differences were nonsignificant between 1st, 2nd and 4th parities (175.56, 117.29 and 87.80 pg/dl), respectively.

- Ewes having female feti had the lowest mean of plasma estradiol-17β (126.79 pg/dl) than those having male feti (149.33 pg/dl) or twins of male and female feti (187.69 pg/dl), while the effect of sex of feti did not show any significant on estradiol-17β.
- Plasma estradiol-17 β was 171.09 pg/dl in ewes having twins, than those of single feti 137.12 pg/dl, while the difference not significant.
- The coefficients of regression of estradiol- 17β on age of ewe were significant ($P<0.05$) with linear and quadratic. However in case of the coefficients of regression of estradiol- 17 β on ewe's body weight were highly significant ($P<0.01$) with linear and quadratic regression.

1.2.1.2: progesterone (P_4):

- Plasma P_4 in Ossimi ewes 13.03 ng/ml insignificantly decreased than Rahmani ewes (14.21 ng/ml).
- Plasma P_4 level increased gradually as pregnancy time increased reaching its maximum level at the 140^{th} day of pregnancy period 55.80 ng/ml in Rahmani and 46.65 ng/ml in Ossimi ewes.
- Plasma P_4 ranged from 11.76 ng/ml in ewes of 1^{st} parity to 15.92 ng/ml in ewes having 4^{th} parities.
- The ewes having male feti had highest ($P<0.05$) plasma progesterone level (14.98 ng/ml) than those having either female feti (12.67 ng/ml) or twins (male and female feti 13.32 ng/ml).
- Plasma P_4 were significantly higher in ewes having twins (15.44 ng/ml) than those of a single feti (11.97 ng/ml)

- The cofficients of regression of P_4 on age of ewe were significant ($P<0.01$) with linear and quadratic trend. Also, in case of the coefficients of regression of P_4 on ewe's body weight were highly significant ($P<0.01$) with linear and quadratic trend.

1.2.2: Thyroid hormones (T_3 and T_4):

1.2.2.1: Triiodothyronine (T_3):

- Plasma T_3 in Rahmani ewes (69.07 ng/dl) did not change significantly than Ossimi ones (66.37 ng/dl).
- Pregnancy time significantly affected blood T_3 of both Rahmani and Ossimi ewes.
- The highest level of plasma T_3 level (73.50 ng/dl) was found in ewes having twins (male and female) feti, while in those having female or male it was 66.50 and 63.15 ng/dl, respectively.
- Plasma T_3 level decreased significantly ($P<0.001$) with increasing parity number. It decreased from 94.42 ng/dl in ewe's having 1^{st} parity to 58.32 ng/dl in those of 4^{th} parity.
- Ewes having single had higher values of T_3 level compared with twins (69.39 vs 66.05 ng/dl).
- The linear and quadratic coefficients of regression of T_3 on age of ewe and also on body weight of ewe are statistically highly significant ($P<0.001$).

1.2.2.2: Thyroxine (T_4):

- Rahmani ewes had higher T_4 mean (5.58 µg/dl) than Ossimi ones (5.40 µg/dl) and the difference between these two values was nonsignificant.

- Days of pregnancy significantly affected blood T_4 level in both Ossimi and Rahmani.
- Plasma T_4 levels decreased insignificantly by increasing ewe's parity. The highest levels of T_4 (5.6 µg/dl) was found in ewes having 3rd parity, and the lowest levels (5.44 µg/dl) was in ewes having 4th parity.
- Ewes having male feti had highest level of plasma T_4 5.84 µg/dl compared with 5.50 and 5.12 µg/dl in ewes having female and twins (male and female), respectively.
- T_4 concentration was higher 5.88 µg/dl in ewes having twins compared with 5.10 µg/dl in ewes having single feti. The difference was significant.
- The linear and quadratic coefficients of regression of T_4 hormone on age of ewe and also on weight of ewe were statistically highly significant ($P<0.001$).

1.3: Blood componats:

1.3.1: proteins fractions:

- Blood total protein, albumin, globuline and albumin, globuline ratio did not significantly affected as a function of breed, parity number, sex and type of feti variations.
- The plasma total protein decreased significantly ($P<0.001$) at 10 days of pregnancy (7.62 and 7.58 gm/dl) to (6.75 and 6.79 gm/dl) at 145th days of pregnancy in Ossimi and Rahmani ewes, respectively. Similarly, the higher plasma level of albumin was in 10 days of pregnancy (4.15 and 4.12 gm/dl) and the lower level in

140^{th} days (3.32 and 3.31 gm/dl) in Ossimi and Rahmani ewes, respectively.

- The higher levels of plasma globulin was in 10^{th} and 30^{th} days (3.47 and 3.70 gm/dl in Ossimi and Rahmani ewes, respectively).
- The A/G ratio was 1.22 in 10^{th} days in both breeds and increased in 120^{th} days of pregnancy (1.55 and 1.41) in Ossimi and Rahmani, respectively.
- The coefficients of linear and quadratic regression equations of the levels of protein fractions on age of ewe were statistically non significant. However, the linear and quadratic regression coefficients of the level of total protein on ewe's body weight were significant ($P<0.05$).

1.3.2: Lipids fractions:

- Breed, parity number and sex and type of feti variations did not significantly affected blood total lipids, cholesterol and their ratio.
- The means of plasma total lipids levels increased significantly ($P<0.001$) and gradually, from 10^{th} days of pregnancy, from 273.09 and 267.75 mg/dl to 342.92 and 338.9 mg/dl in 145^{th} days in Ossimi and Rahmani ewes, respectively. Similarly, the levels of cholesterole increased from 93.49 and 90.35 mg/dl in 10^{th} days of pregnancy to (134.79 and 141.81 mg/dl) in 145^{th} days for Ossimi and Rahmani ewes, respectively.
- The total lipids, cholesterol (mg/dl) and L/C ratio increased gradually from 1^{st} parity (285.27,125.01 gm/dl) and 2.42 ratio to the 4^{th} parity (330.81, 128.24 mg/dl) and 2.63 ratio, respectively.

- The regression coefficients of linear and quadratic regression equation of the levels of total lipids and cholesterol on age were statistically significant ($P<0.01$ or $P<0.001$). While, the coefficients of regression (linear and quadratic) of the levels of lipids fraction on body weight of ewe were nonsignificant.

2: Post partum period:

2.1: The hormonal pattern during post partum period:

2.1.1: Sexual hormone:

- Rahmani ewes have relatively higher means of estradiol-17β and progesterone levels (1207.60 pg/dl and 2.69 ng/ml, respectively) compared with (1074.73 pg/dl and 2.64 ng/ml, respectively) in Ossimi ewes.
- Means of estradiol - 17β were 1123.5 and 1139.5 pg/dl at 30^{th} days, and 1025.9 and 1280.6 pg/dl at 60^{th} days after parturition in Osimi and Rahmani ewes, respectively. While, the means of progesterone were 1.98 and 1.84 ng/ml at 30^{th} days and 3.29 and 3.16 ng/ml at 60^{th} days after parturition in Ossimi and Rahmani ewes, respectively.
- Plasma estradiol -17β level increased significantly ($P<0.05$) by increasing number of Parity (598, 832, 1068 and 2067 pg/dl) in 2^{nd}, 3^{rd}, 4^{th} and 5^{th} parities, respectively. Similarly, progesterone increased significantly 1.45, 1.36 3.80 and 3.67 ng/ml, with increasing parity number.
- The means of plasma estradiol-17β and progesterone level were highest 1730.50 pg/dl, and 2.84 ng/ml respectively in ewes having

twins (male and female), than in ewes lambed male (942.67 pg/dl and 2.49 ng/ml) and having female lambs (750.31 pg/dl and 2.38 ng/ml, respectively).

- Ewes lambed twins lambs had higher value of progesterone (2.83 ng/ml) compared with those having a single lamb (2.30 ng/ml). While the means of plasma estradiol-17β were (1018.84 and 1263.49 pg/dl in ewes lambed twins and single lambed, respectively.
- The coefficients linear and quadratic regression of the levels of estradiol-17β on age of ewe were stistically significant ($p<0.01$ and $p<0.001$), respectively), while it was found non significant coefficients of regression (linear and quadratic) of the level of both of progesterone and estradiol-17β on body weight of ewe were detected during this period.

2.1.2: Thyroid hormones:

- Thyroid hormones T_3 and T_4 did not change significantly due to factors studied i.e., breed, parity number and sex of lambs. However, type of birth affected significantly on blood T_4 cancentration.
- Obtained date showed no significant linear and quadratic variation due to ewe's age on T_3 or T_4 levels. Also, analysis of variance revealed non significant linear and quadratic variation in plasma T_3, while showed, significant linear and quadratic variation ($p<0.01$) due to ewe's body weight on T_4.

2.2: Blood components:

2.2.1.: Protein fraction:

- The differences between means of Tp, A, G, and A/G ratio due to effect of breed were non significant.
- The means value of Tp, A and A/G ratio increased in 60^{th} days compared with the means at 30^{th} days.
- The mean values of plasma total protein level decreased (6.84 gm/dl) in 5^{th} parity, compared with 7.03, 7.04 and 7.10 gm/dl in 2^{nd} , 3^{rd} and 4^{th} parities respectively. The mean values of plasma albumin level were 3.61, 3.46, 3.68 and 4.05 gm/dl and the mean values of plasma globulin means were 3.43, 3.58 3.41 and 2.79 gm/dl and value of A/G ratio were 1.34, 1.04, 1.16 and 1.73 in 2^{nd}, 3^{rd}, 4^{th} and 5^{th} parity, respectively.
- The effect of sex and type of lamb on plasma protein fractions was non significant.
- The coefficient of linear and quadratic regression of total protein, albumin, globulin and A/G ratio on age and body weight of were statistically non significant.

2.2.2: Lipids fractions:

- The mean levels of plasma L,C and L/C ratio were (330.25, 138.99 mg/dl and 2.52 respectively) in Rahmani ewes compared with (334.51, 149.38 mg/dl and 2.26, respectively) in Ossimi ewes. Breed of ewes had non significant effect on plasma L,C and significant ($p<0.05$) in L/C ratio.

- Mean of L,C and L/C ratio in blood plasma in ewes at the 30th days of lactation period were (334.56 mg/dl, 148.80 mg/dl and 2.28) in Ossimi ewe's compared with (333.46 mg/dl, 142.44 mg/dl and 2.48) in Rahmani ewes, respectively. While, it was (334.45 mg/dl, 149.95 mg/dl and 2.26) in Ossimi ewes and (327.04 mg/dl, 135.55 mg/dl and 2.56) in Rahmani ewes at 60th days, respectively.
- Parity number had significant effect on L/C ratio and non significant on both of total lipids and cholesterol levels.
- The effect of sex of lambs on plasma L and C levels was non significant while it was significant ($p<0.05$) on L/C ratio.
- The effect of type of lambs on L and L/C ratio was non significant. However, the differences amoung levels of C were significant ($p<0.05$).
- Coefficients of linear and quadratic regression of L on age of ewe were significant, while, analysis of variance revealed non significant linear and quadratic variation in plasma C and L/C ratio. Similarly, the coefficient of linear and quadratic regression of lipid fractions on body weight of ewe were non significant during post partum period.