



EFFECT OF FETUS SEX, LATE GESTATION AND LACTATION PERIOD OF AWASSI EWES ON SOME HEMATOLOGICAL AND BIOCHEMICAL PARAMETERS

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Abstract

This study was undertaken to explore the effect of lamb's sex and prenatal periods and 2, 4, 6, 8 and 10 weeks' postpartum and the interaction between them on some of blood, chemical in Awassi ewes, this experiment was carried out in one of the private fields in Al-Huwaish in Diyala Governorate during the period from 2\11\2018 to 1\4\2019 on 12 Awassi ewes where 6 of them were born male and the other 6 were born female in last week of pregnancy and lactation period, the result was:-

No significant effect of the sex of lambs in the level of total protein, urea, cholesterol, triglycerides, calcium, phosphorus, ALT and AST, while total protein and urea increased significantly in the second week postpartum compared to other periods ($p < 0.01$), urea concentration increased significantly ($p < 0.01$) in the period between the interaction of lamb's sex and the second week postpartum compared to other interactions.

While the lambs sex did not register significant difference for each of PCV, Hb and MCHC, while there was a high significant in both of PCV, Hb and MCHC in 6, 8 and 10 weeks' postpartum when compared with other periods, MCHC record significantly higher in the sex of lambs and 6, 8 and 10 weeks' postpartum compared to the other interactions.

Key words: sex, periods, biochemical parameters, Awassi ewes.

Introduction

Livestock from part of the national agricultural income and play a key role in meeting animal protein requirement since sheep contribute almost 50% of the animal production in Iraq (Juma and Al-kass, 2004) Iraq is one of the countries that have sheep with internationally recognized breeds in particular the Awassi sheep breed which constituted 55-60% of the total Iraqi sheep scattered in the northern and central regions of Iraq (Al-saaig and Al-kass, 1992).

Measurement of blood and biochemical parameters is important in the evaluation of animal activity and gives an indicator of animal health & this is reflected in the productive traits blood & biochemical parameters are effected by breed age, physiological condition season, nutrition, and so on, the conclusion from knowing the natural rates of bloody standards is that the physiological regulation of the animals body work well and this reflects it is ability to adapt to the prevailing environmental conditions (Hobi, 2012; Al-Robaie *et al.*, 2015 and Abd

Al-Latif 2017). Found there was change in total protein and urea levels during pregnancy and postpartum periods, the reason of total protein change in blood during pregnancy period was due to increase fetus growth and its need for use of amino acid in mothers' blood circulation for protein synthesis in fetus muscles, (Al-Rubaie *et al.*, 2015, Abdul-Lateef 2017, Al-Mjamai 2011, Piccione *et al.*, 2009). While there was highly significant for lambs' sex in cholesterol level during postpartum period in ewes that born female compared with ewes that born male, Abdul-Lateef (2017). There was significant difference in triglyceride, calcium, phosphorus, ALT and AST during Pregnancy and postpartum period, (Al-Mjamai 2011, Piccione *et al.*, 2009, Antunovic *et al.*, 2002, Antunovic *et al.*, 2011). there was change in rate of PCV, Hb and MCHC during Pregnancy and postpartum periods in ewes (Abdul-Lateef 2017, Al-Dabig and Al-Maraziny 2010, Zaid 2009, and Leilson *et al.*, 2017).

Materials and methods

This experiment was conducted in Al-Huwaish area

of Al-Khalis district in Diyala governorate between (Baghdad and Diyala) road in one of the private field, 12 ewes were selected 6 of them were born males and the other 6 were born females where research was completed on these 12 ewes, the ewes used were all pregnant in the second time approximately 2.5 years old.

Blood samples from these ewes were taken at intervals of 6 draws, the first draw was in a week before birth and the others five draws after birth (2, 4, 6, 8 and 10 weeks' postpartum), blood samples were taken from jugular vein by 6 mm sterile medical syringes in an anticoagulant test tube then inserted into the centrifuge at a speed of 300 RPM and for 15 minutes to get the serum which put in Eppendorf tubes after numbering and kept in the freezer at -20c until in biochemical analysis. Which 2ml take from jugular vein put in special tube content anticoagulant (EDTA) for blood analysis PCV, Hb then take MCHC mathematically, measurement of biochemical characteristics was adopted using a measurement kit prepared by the German Company Human rights for all test done.

The data obtained were analyzed according to the program SPSS (2002) by Adopting Full Random Design

Table 1: Effect of lamb's sex in some biochemical parameters in the blood of local Awassi ewes (mean± standard error).

Significant	Male	Female	Sex Characteristic
N.S	5.38 ± 0.18	5.46 ± 0.18	Total protein(mg\dl)
N.S	24.79 ± 1.26	22.71 ± 1.14	urea (mg\dl)
N.S	100.5 ± 3.09	95.61 ± 3.03	Cholesterol (mg\dl)
N.S	52.46 ± 1.94	51.65 ± 1.79	Triglyceride (mg\dl)
N.S	11.44 ± 0.10	11.13 ± 0.12	Calcium (mg\dl)
N.S	5.70 ± 0.10	5.67 ± 0.08	Phosphorus (mg\dl)
N.S	25.17 ± 0.07	25.15 ± 0.08	ALT(IU\L)
N.S	89.33 ± 0.11	89.25 ± 0.14	AST(IU\L)

N.S. means there is no significant difference between these mean. n=36

Table 2: Effect of periods in some biochemical parameters in the blood of local Awassi ewes (mean ± standard error).

Period Characteristic	Prenatal	After 2 Week	After 4 Week	After 6 Week	After 8 Week	After 10 Week	Signnificant
Total protein(mg\dl)	0.26 ± 4.35 c	0.39 ± 6.09 a	0.37 ± 5.54 b	0.32 ± 5.36 b	0.15 ± 5.47 b	0.18 ± 5.69 b	**
Urea(mg\dl)	0.22 ± 16.10 c	2.24 ± 29.64 a	2.05 ± 25.94 a	1.99 ± 22.32 b	1.74 ± 24.34 b	1.71 ± 24.15 b	**
Cholesterol (mg\dl)	0.73 ± 89.13	8.59 ± 111.8	6.94 ± 98.11	3.33 ± 92.69	2.24 ± 101.2	3.81 ± 95.25	N.S.
Triglyceride (mg\dl)	0.63 ± 43.58	5.02 ± 58.50	3.36 ± 56.97	2.36 ± 51.16	1.92 ± 50.48	2.78 ± 51.66	N.S.
Calcium(mg\dl)	0.16 ± 11.03	0.31 ± 11.03	0.16 ± 11.27	0.13 ± 11.36	0.14 ± 11.51	0.21 ± 11.52	N.S.
Phosphorus (mg\dl)	0.16 ± 5.87	0.12 ± 5.37	0.14 ± 5.92	0.19 ± 5.65	0.15 ± 5.66	0.17 ± 5.66	N.S.
ALT(IU\L)	0.14 ± 24.94	0.10 ± 25.27	0.15 ± 25.10	0.13 ± 25.23	0.16 ± 25.08	0.10 ± 25.35	N.S.
AST(IU\L)	0.20 ± 89.16	0.18 ± 89.46	0.25 ± 89.11	0.21 ± 89.26	0.25 ± 89.57	0.19 ± 89.19	N.S.

N.S. means there is no significant difference between these mean.

** means there is significant difference between these mean. n = 36

(CRD), to determine the significant of the differences between the average Dunkin's Multiple Range test was used (Steel and Torrie, 1980) qualities that are naturally distributed, the use of Mann witny test and the Kroskal wiles test traits were not distributed naturally.

Results and Discussion

The result in table 1 showed no significant effect of lamb's sex on the calcium and phosphorus level which were 11.44 and 11.13 mg\dl for calcium and 5.70 and 5.67mg\dl for phosphorus for male and female respectively. while the result of the statistical analysis which shown in table 1 no significant effect of lamb's sex (according to Mann witny test) for total protein, urea, cholesterol, triglyceride, ALT and AST levels.

The level of total protein was 5.38, 5.46g\dl, urea level 24.79, 22.71g\dl, cholesterol level 100.5, 95.61 mg\dl, triglyceride 52.46, 51.65 mg\dl, AST 89.33, 89.25 IU\L, ALT 25.17, 25.15 IU\L for male and female respectively table 1.

The result of statistical analysis in table 2 show there was significant effect ($P \leq 0.05$) in the rate of total protein and urea during periods before birth and after 2, 4, 6, 8 and 10 weeks' postpartum while there was no significant difference in the level of cholesterol, triglyceride, ALT, AST, calcium and phosphorus during these periods.

Where it is noted that the highly significant in the total protein level was in the second week postpartum which was 6.09g\dl while prenatal period record low level of total protein which was 4.35g\dl when compared with the periods in 4, 6, 8 and 10 week postpartum which the total protein level were 5.54, 5.36, 5.47, 5.69g\dl respectively. The reason of low total protein level before birth when compared with other study periods after birth may be due to the fact that this period is where high protein needs to obtain increased growth in the fetus and fetal membranes and placenta (Hobi *et al.*, 1994) with a decrease in the amount of feed intake as a result of

Table 3: The effect of overlap between lamb sex and period in some biochemical parameters in local Awassi ewes blood (mean ± standard error).

Period	Characteristic	Sex	Prenatal	After 2 Week	After 4 Week	After 6 Week	After 8 Week	After 10 Week	Significant
Total protein(mg\dl)		Male	0.14 ± 3.99	0.51 ± 6.24	0.53 ± 5.69	0.52 ± 5.40	0.13 ± 5.32	0.26 ± 5.64	**
		Female	0.49 ± 4.71	0.63 ± 5.93	0.56 ± 5.39	0.42 ± 5.33	0.26 ± 5.63	0.27 ± 5.75	
Urea(mg\dl)		Male	0.26 ± 16.05	3.48 ± 30.61	2.68 ± 27.74	3.42 ± 23.60	1.89 ± 25.76	2.82 ± 24.97	**
		Female	0.39 ± 16.15	3.10 ± 28.67	3.17 ± 24.14	2.26 ± 21.04	2.99 ± 22.91	2.18 ± 23.34	
Cholesterol (mg\dl)		Male	0.83 ± 88.83	13.44 ± 116.9	7.90 ± 105.8	5.00 ± 93.73	2.81 ± 102.0	4.85 ± 95.60	N.S.
		Female	1.27 ± 89.44	11.58 ± 106.8	11.19 ± 90.33	4.85 ± 91.64	3.74 ± 100.5	6.36 ± 94.60	
Triglyceride (mg\dl)		Male	0.78 ± 43.15	8.42 ± 59.82	4.71 ± 57.51	3.51 ± 51.65	1.86 ± 50.81	3.85 ± 51.86	N.S.
		Female	1.03 ± 44.02	6.27 ± 57.17	5.25 ± 56.44	3.47 ± 50.67	3.57 ± 50.15	4.38 ± 51.46	
Calcium(mg\dl)		Male	0.25 ± 11.28	0.47 ± 11.29	0.05 ± 11.45	0.17 ± 11.41	0.23 ± 11.64	0.14 ± 11.60	N.S.
		Female	0.18 ± 10.78	0.44 ± 10.76	0.31 ± 11.09	0.22 ± 11.30	0.17 ± 11.39	0.42 ± 11.44	
Phosphorus (mg\dl)		Male	0.24 ± 6.12	0.18 ± 5.36	0.23 ± 5.94	0.32 ± 5.67	0.23 ± 5.62	0.27 ± 5.50	N.S.
		Female	0.18 ± 5.63	0.19 ± 5.38	0.17 ± 5.89	0.23 ± 5.63	0.21 ± 5.70	0.21 ± 5.81	
ALT(IU\L)		Male	0.20 ± 25.02	0.09 ± 25.31	0.23 ± 25.08	0.18 ± 25.00	0.19 ± 25.18	0.12 ± 25.43	N.S.
		Female	0.20 ± 24.85	0.19 ± 25.23	0.21 ± 25.12	0.14 ± 25.47	0.28 ± 24.98	0.17 ± 25.28	
AST(IU\L)		Male	0.32 ± 89.22	0.24 ± 89.55	0.25 ± 89.47	0.39 ± 89.32	0.27 ± 89.17	0.18 ± 89.25	N.S.
		Female	0.25 ± 89.09	0.47 ± 89.59	0.360 ± 89.05	0.34 ± 88.90	0.20 ± 89.74	0.36 ± 89.13	

N.S. means there is no significant difference between these mean. n = 36

Table 4: The effect of lamb sex in some blood parameters in local Awassi ewes (mean ± Standard error).

Significant	Male	Female	Sex Characteristic
N.S	0.78 ± 27.69	0.81 ± 27.94	PCV (%)
N.S	0.26 ± 8.50	0.27 ± 8.60	Hb (g\dl)
N.S	0.07 ± 30.71	0.07 ± 30.71	MCHC (%)

N.S. means there is no significant difference between these mean. n = 36

competition between the size of the rumen and the size of the uterus containing the fetus (Al-Mjamai, 2011). While for the level of urea there was highly significant in the second and fourth weeks postpartum which were 29.64, 25.94 mg\dl when compared with prenatal period and 6, 8 and 10 weeks postpartum, while prenatal period record least significant level when compared with other periods which urea level was 16.10 mg\dl, the reason of the highest level in postpartum period over the pregnant period may be due to the fact that at this stage the process of milk production takes place and the energy exchange increase and the proteins are destroyed thus increasing the urea content.

The result of statistical analysis in table 3 according to Kroskal wiles test show there was high significant effect (P<0.01) in urea level for interaction between lamb sex and pre-natal period and after 2, 4, 6, 8, 10 weeks' postpartum, while there was no significant difference in total protein, cholesterol, triglyceride, ALT and AST levels due to this interaction.

Where it is noted that there was highly significant for male sex in the second week postpartum which was 30.61 mg\dl over the other interaction between lamb sex and the study periods, While the interaction for pre-natal period and male sex record low level (16.05mg\dl) when compared when compared with interaction of male sex for periods 4, 6, 8, 10 weeks which was 27.74, 23.60, 25.76, 24.97 mg\dl respectively, while for the interaction of female sex there was high significant in the second week postpartum 28.67 mg\dl over other periods, while pre-natal period for female sex record low level 16.15 mg\dl compared with interaction of sex and periods 4, 6, 8, 10 weeks which was 24.14, 21.04, 22.91, 23.34 mg\dl respectively.

The result in table 4 showed there was no significant effect of lamb sex for both PCV and Hb which PCV rate in male was 27.69% and female was 27.94%, while hemoglobin concentration in male was 8.50 g\dl and in female 8.60 g\dl. while the result of statistical analysis in table 4 according to Mann witny test show there was no significant effect in MCHC level in male and female sex

Table 5: Effect of periods in some blood parameters (mean \pm standard error).

Period Characteristic	Prenatal	After2 week	After4 week	After6 week	After8 week	After10 week	Significant
PCV(%)	22.0 \pm 0.75c	23.75 \pm 0.55c	27.75 \pm 1.12b	31.16 \pm 0.83a	31.58 \pm 1.13a	30.66 \pm 0.71a	**
Hb(g/dl)	6.54 \pm 0.21c	7.20 \pm 0.18c	8.55 \pm 0.37b	9.68 \pm 0.27a	9.82 \pm 0.37a	9.51 \pm 0.23a	**
MCHC(%)	30.06 \pm 0.12b	30.32 \pm 0.09b	30.76 \pm 0.09b	31.04 \pm 0.07a	31.07 \pm 0.08a	31.01 \pm 0.05a	**

Different letters within single row referred to presence of highly significant difference between means. n = 36.

Table 6: Effect of interaction between lamb sex and period in some blood parameters in local Awassi ewes (mean \pm standard error).

Characteristic	Sex	Periods						Significant
		Prenatal	After 2 Week	After 4 Week	After 6 Week	After 8 Week	After 10 Week	
PCV (%)	Male	1.14 \pm 22.33	0.70 \pm 23.83	1.56 \pm 26.33	0.60 \pm 31.16	2.09 \pm 31.66	0.74 \pm 30.83	N.S.
	Female	1.08 \pm 21.66	0.91 \pm 23.66	1.51 \pm 29.16	1.64 \pm 31.16	1.11 \pm 31.50	1.28 \pm 30.50	
Hb (g/dl)	Male	0.26 \pm 6.56	0.23 \pm 7.23	0.52 \pm 8.10	0.19 \pm 9.66	0.69 \pm 9.85	0.24 \pm 9.58	N.S.
	Female	0.36 \pm 6.51	0.31 \pm 7.18	0.50 \pm 9.00	0.54 \pm 9.70	0.37 \pm 9.80	0.42 \pm 9.45	
MCHC	Male	0.17 \pm 30.1	0.11 \pm 30.30	0.14 \pm 30.71	0.03 \pm 31.0	0.14 \pm 31.05	0.04 \pm 31.07	**
	Female	0.19 \pm 30.02	0.15 \pm 30.32	0.12 \pm 30.82	0.14 \pm 31.08	0.10 \pm 31.09	0.10 \pm 30.9	

N.S. means there is no significant difference between these mean.

** means there is significant difference between these mean. n = 36

which was 30.7, 30.71% respectively.

Where it is noted in table 5 that PCV rate was highly significant during 6, 8, 10 weeks' postpartum which record 21.16, 31.58, 30.66% for these periods respectively over other study periods, while record least significant level for it in prenatal period (22.0%) and second week postpartum (23.75%) compared with other periods.

While for hemoglobin there was highly significant in 6, 8, 10 weeks which its concentration was 9.68, 9.82, 9.51 g/dl respectively compared with pre-natal period and 2, 4 weeks' postpartum which record 6.54, 7.20, 8.55 g/dl for these periods respectively, the reason of this low in percentage for the size of the compacted blood cell and hemoglobin in the last gestation was due to high body fluid during this period leading to hemo-dilution.

The result of statistical analysis in table 5 according to Kroskal wiles test show there was highly significant in MCHC level in 6, 8, 10 weeks' postpartum which was 31.04, 31.07, 31.01% compared with pre-natal period and 2, 4 weeks' postpartum which MCHC level was 30.06, 30.32, 30.76% respectively.

The result of analysis in table 6 show there was computational excellence in PCV rate in interaction between lamb sex and the studied periods, where that above was computationally for the interaction between the lamb male and female sex and eight-week postpartum which was 31.66, 31.50% respectively, while the interaction for pre-natal period and lamb male and female sex record least PCV rate. The result of statistical analysis in table 6 according to Karlus wiles test show there was high significantly effect ($P < 0.01$) in MCHC%

for interaction between lamb sex and pre-natal period and 2, 4, 6, 8, 10 weeks postpartum where it is noted that there was highly significant in MCHC for interaction between lamb male and female sex in period 6, 8, 10 weeks postpartum which was 31.0, 31.08, 31.05, 31.09, 31.07, 30.95% for these interactions respectively interaction of lamb sex and other study periods, Through the result of our study in relation to the characteristics of the volume of compacted blood cell (PCV) and hemoglobin concentration and the percentage to the cell concentration rate (MCHC) noted that it is within the natural ranges of ewes and this is evidence that the ewes used in our study were bred in good health and nutritional conditions.

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