

EFFECT OF SINGLE DOSE DEXAMETHASONE (0.1 mg/kg) ON WHITE BLOOD CELL COUNTS AND SERUM GLUCOSE LEVELS IN HEALTHY EWES

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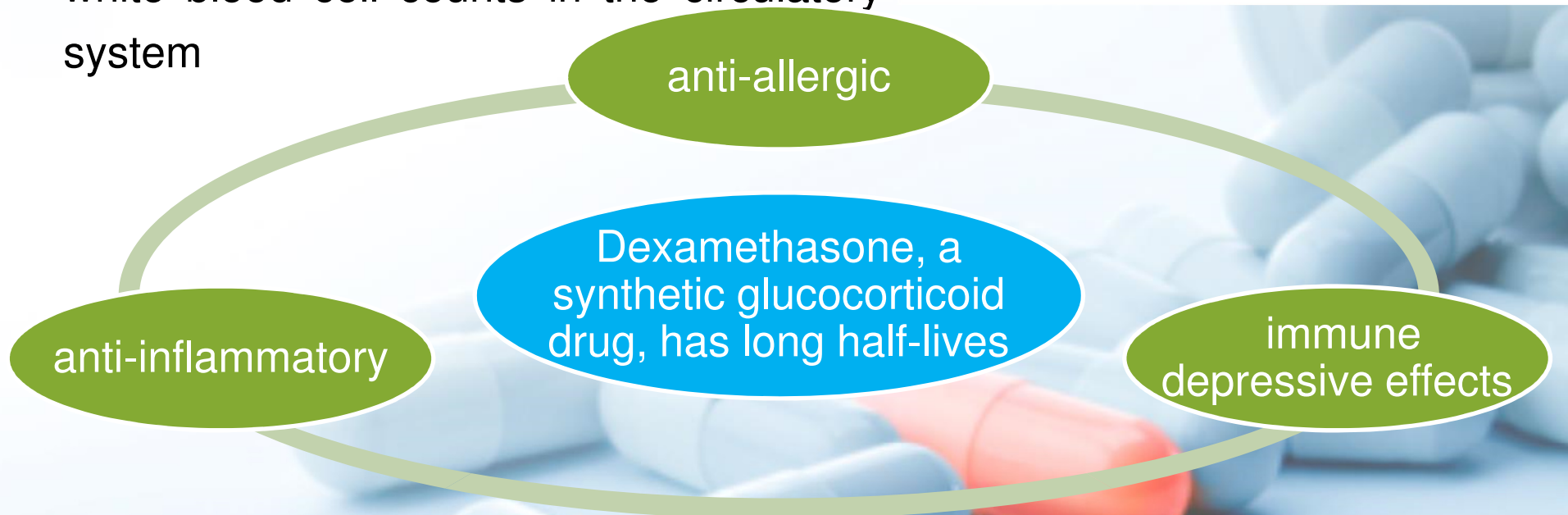
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1. Introduction



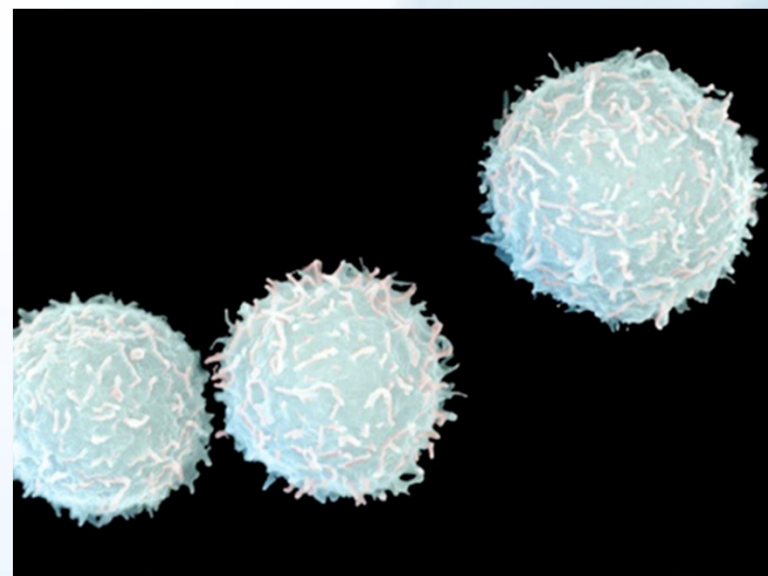
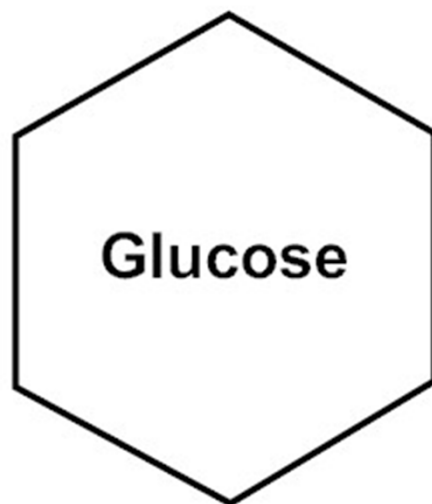
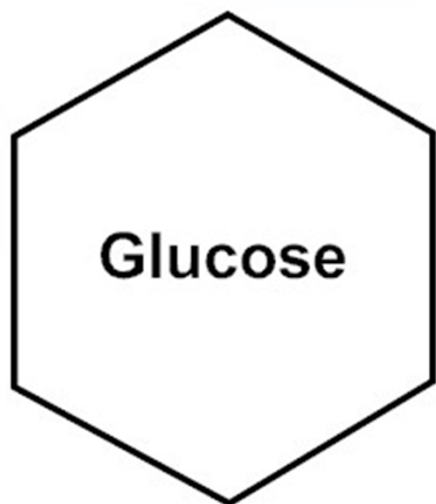
- Glucocorticoids affect protein, lipid and carbohydrate metabolism.
- Proteins and lipids are converted to glucose by glucocorticoids during the stress-induced activation.

- Glucocorticoids induce glucose production and diminish peripheral glucose uptake
- Glucocorticoids depress T and B cells and phagocytes activities and acquired immune functions while they increase white blood cell counts in the circulatory system



- Many detailed information (Dosage, laboratorial-clinical effects, side effects, etc.) exist when glucocorticoids are used in the small animal practice,
- whereas there is no sufficient data when dexamethasone is used in sheep

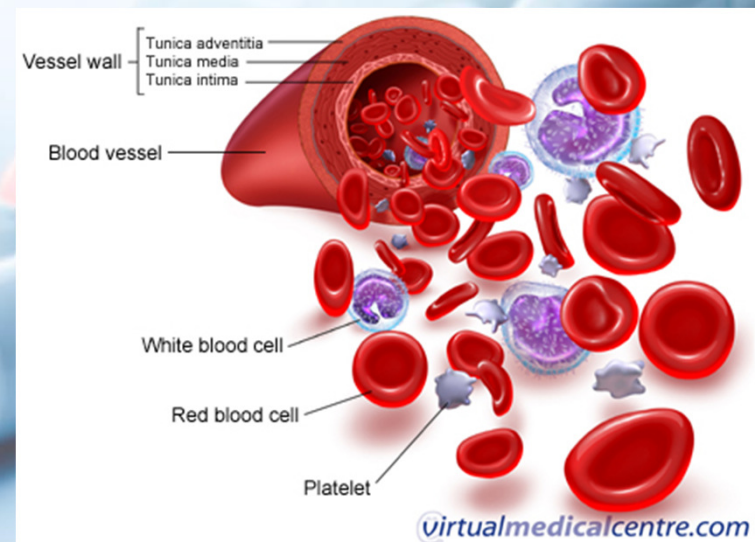
- ✓ It has been hypothesized that dexamethasone may show similar effect and this effect may be determined by measuring some hemogram and biochemical values in sheep, as well.



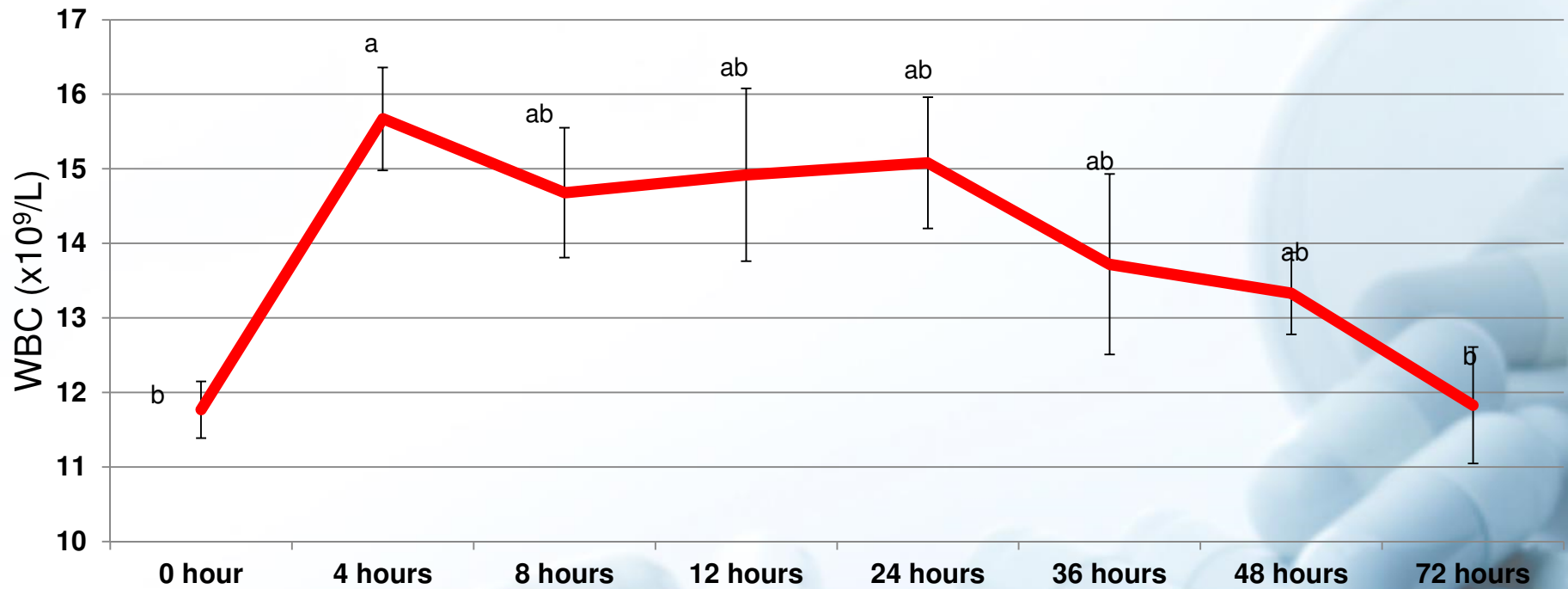
- ✓ The first aim of this research was to determine that effect of dexamethasone on the serum glucose and white blood cell (WBC) counts. In addition, effect of dexamethasone on the other hemogram values was

2. Materials and Methods

- Totally 8 Akkaraman (58 ± 6 kg, >3 years) sheep were administered with 0.1 mg/kg (SC, single dose) dexamethasone (Dekort[®] amp, Deva Ilac, Istanbul, Turkey)
- Blood samples were taken before (0. hour, control) and after treatments at 4, 8, 12, 24, 36, 48 and 72 hours
- Hematology and biochemistry parameters were determined from blood samples.
- Data were presented as mean \pm SE.

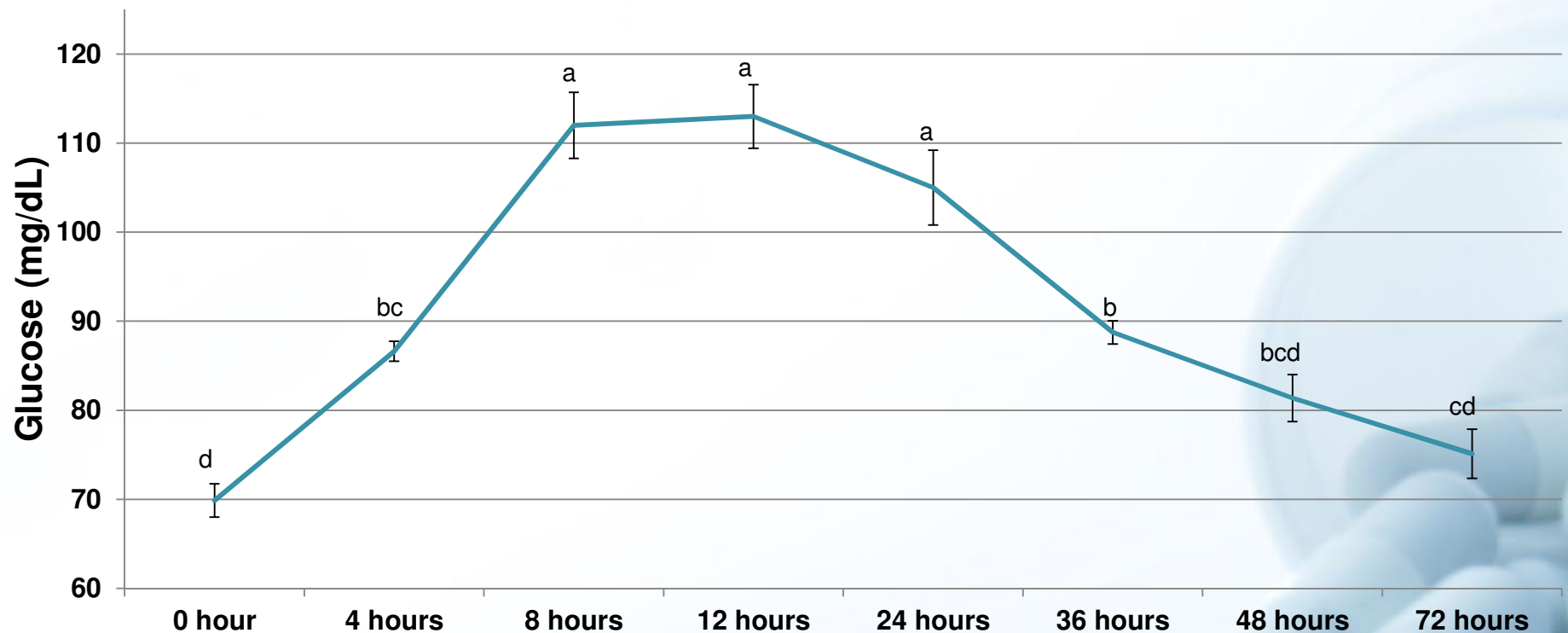


3. Results



Graphic 1. White blood cell counts after single dose dexamethasone (0.1 mg/kg) treatment in healthy sheep.

- After dexamethasone treatment, higher WBC level was determined ($P < 0.05$) at 4th hour when compared to sampling times (Graphic 1).



Graphic 2. Serum glucose levels after single dose dexamethasone (0.1 mg/kg) treatment in healthy sheep.

- Peak glucose concentration was determined at 12th hour after dexamethasone administration (Graphic 2)
- In addition, higher glucose levels obtained from 8, 12 and 24th hours were statistically significant ($P < 0.05$) from other sampling times.

- Dexamethasone caused statistically significance ($P < 0.05$) fluctuations in the total bilirubin, BUN and triglyceride levels
- But it was not determined ($P > 0.05$) in the other hemogram and biochemical values

Table 1. Hemogram values of sheep after dexamethasone (0.1 mg/kg, single dose, SC) treatments (mean \pm SE).

	0 hour	4 hours	8 hours	12 hours	24 hours	36 hours	48 hours	72 hours
RBC ($\times 10^{12}/L$)	9.26 \pm 0.34	9.46 \pm 0.37	9.28 \pm 0.35	8.80 \pm 0.35	8.89 \pm 0.27	9.10 \pm 0.17	9.18 \pm 0.31	8.61 \pm 1.26
PLT ($\times 10^9/L$)	422 \pm 32.4	411 \pm 28.3	446 \pm 28.5	388 \pm 37.89	376 \pm 42.5	398 \pm 20.7	364 \pm 18.45	369 \pm 39.0
HGB (g/dL)	9.43 \pm 0.32	9.36 \pm 0.45	8.08 \pm 1.20	8.82 \pm 0.37	8.80 \pm 0.27	9.26 \pm 0.21	9.16 \pm 0.34	10.0 \pm 0.32
HTC (%)	36.6 \pm 1.03	37.5 \pm 1.58	36.7 \pm 1.28	34.5 \pm 1.32	34.2 \pm 0.87	35.4 \pm 0.86	35.4 \pm 1.04	37.7 \pm 0.71

RBC: Red blood cell, PLT: platelet, HGB: Hemoglobin, HTC: Hematocrit.



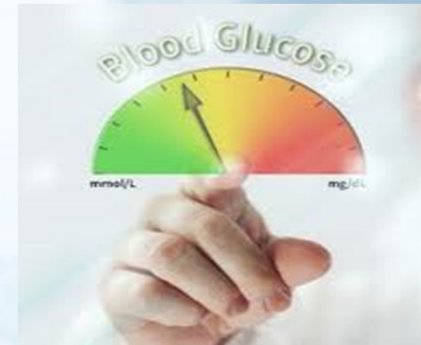
	0 hour	4 hours	8 hours	12 hours	24 hours	36 hours	48 hours	72 hours
LDH (U/L)	448±48.2	499±35.5	543±42.72	520±41.4	473±28.7	479±31.6	464±31.3	494±32.0
ALP (U/L)	82.8±7.62	76.6±5.28	79.9±7.10	83.6±6.34	94.4±9.47	89.8±7.74	88.8±9.58	87.0±8.66
Tbil (mg/dL)	0.24±0.01 ^a	0.18±0.03 ^{ab}	0.22±0.04 ^{ab}	0.20±0.03 ^{ab}	0.13±0.02 ^{ab}	0.11±0.01 ^b	0.17±0.02 ^{ab}	0.19±0.02 ^{ab}
ALT (U/L)	12.4±1.16	12.9±1.20	12.6±1.25	12.5±1.13	11.4±1.03	12.0±1.14	12.1±1.10	10.5±0.94
AST (U/L)	86.3±7.27	87.8±8.07	90.6±8.47	86.5±8.04	79.0±5.77	78.0±6.50	78.8±6.22	77.0±5.83
GGT (U/L)	34.8±2.08	36.1±2.06	37.1±2.11	37.0±1.62	36.3±2.05	39.8±2.53	41.6±2.85	44.3±3.29
Tprot (g/dL)	5.99±0.13	6.16±0.17	6.25±0.30	6.39±0.20	6.32±0.14	6.50±0.14	6.36±0.23	6.44±0.21
Alb (g/dL)	2.90±0.05	3.01±0.04	3.07±0.12	3.18±0.12	3.18±0.07	3.25±0.06	3.18±0.04	3.17±0.02
BUN (mg/dL)	8.90±0.51 ^b	10.1±0.53 ^{ab}	11.4±0.60 ^{ab}	11.4±0.70 ^{ab}	9.08±0.58 ^b	9.36±0.72 ^b	11.8±0.83 ^{ab}	12.7±0.84 ^a
CR (mg/dL)	0.78±0.04	0.74±0.04	0.74±0.05	0.67±0.05	0.72±0.03	0.73±0.04	0.75±0.03	0.84±0.03
CHL (mg/dL)	61.6±2.98	61.8±2.82	65.4±4.14	65.9±3.60	65.3±3.25	69.6±3.64	68.1±4.24	67.0±4.42
TRG (mg/dL)	10.3±0.75 ^{bcd} e	7.00±0.46 ^{de}	7.75±1.22 ^{cde}	5.87±0.85 ^e	16.5±1.59 ^a	12.8±0.75 ^{ab}	11.5±0.65 ^{bc}	10.8±1.11 ^{bcd}
HDL (mg/dL)	37.6±1.86	38.8±2.13	40.6±2.87	40.5±1.79	39.5±1.85	43.1±2.43	42.9±2.83	41.9±3.10
LDL (mg/dL)	34.8±3.01	34.5±2.62	36.8±3.28	38.3±3.47	35.6±2.91	39.1±3.22	38.1±3.47	35.9±3.63

LDH: Lactate dehydrogenase, ALP: Alkaline phosphatase, Tbil: Total bilirubin, ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, GGT: Gamma glutamyltransferase, Tprot: Total protein, Alb: Albumin, BUN: Blood urea nitrogen, CR: Creatinine, CHL: Cholesterol, TRG: Triglyceride, HDL: High density lipoprotein, LDL: Low density lipoprotein, a, b, c, d,e: Different letters in the same line are statistically significant (P<0.05).

4. Discussion

- ✓ Dexamethasone is a synthetic glucocorticoid drug and recommended parenterally at the dose of 0.04-1 mg/kg in the treatment of pregnancy toxicity, shock, termination of pregnancy in sheep
- ✓ In the current research, dexamethasone increased ($P < 0.05$) WBC levels at 4th hours after treatment, and this higher levels were observed ($P > 0.05$) during 48 hours
- ✓ However other hematology parameters was in normal limits.
 - ✓ Effect of dexamethasone on the WBC counts may depend on dose or animal kinds.
 - ✓ Increased WBC counts were reported in female turkeys after dexamethasone treatment, but similar effect of dexamethasone was not observed in males
 - ✓ And, increased WBC counts have been determined in cows.
 - ✓ These results may indicate dexamethasone directly affect WBC level in sheep and has no effect other hemogram values

- ✓ Dexamethasone increased ($P < 0.05$) the glucose concentration at 8th hours, and higher glucose levels were monitored during 48 hours
- ✓ It is well known that glucocorticoids increase serum glucose levels via impairing peripheral glucose uptake, decreasing glucose utilization, and increasing hepatic production.
- ✓ This result may indicate that 0.1 mg/kg dose of dexamethasone dramatically increases serum glucose level and this increased level of glucose may be observed during 2 days in sheep.
- Decreased total bilirubin, increased BUN and fluctuations in the triglyceride levels were determined ($P < 0.05$).
- Although these changes are below the reference range of ewes



5. Conclusions

- It may be stated that dexamethasone, a synthetic glucocorticoid, directly affects white blood cell counts and glucose metabolism during 2-3 days in sheep, and these effects of dexamethasone are considered in the evaluation of laboratory values in sheep when dexamethasone is administered



THANK YOU



FOR YOUR ATTENTION