

Comparative study of some Serum Biochemical parameters of cattle and sheep of the marshes in the south of Iraq

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Abstract

This study includes the normal values of biochemical parameters of cattle and sheep lived in Marshes of south of Iraq .The serum levels of glucose, urea, creatinine, cholesterol ,triglyceride,total protein, albumin, globulin ,calcium(ca), potassium(k), Asparate amino transferase(AST),Alanin amino transferase(ALT), Alkalinephosphatase (ALP) and Lactate dehydrogenase (LDH) were determined .The results showed there are non significant differences in all parameters of male cattle compared with female , except the serum glucose which decreased significantly in male compared with female. There are a significant increase in cholesterol and potassium of male sheep compared with female , whereas the other parameters did not show a significant difference ($p<0.05$) between them. also, the results indicated a significant increase in TG , cholesterol , AST , ALK and LDH of male and female cattle compared with male and female sheep. There were not significant differences in other parameters.

Key words: Biochemical parameters, Cattle, Sheep, Marshes of Iraq.

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Introduction

Biochemical determination of serum constituents can provide valuable information as relating to nutrition ,sex, age and physiological status of the animal (1). Biochemical analyses of blood serum are very useful to get insight in the metabolic and health status of animals. During diagnostic procedure it is very useful to compare the values obtained from ill animals with normal values in healthy animal (2). Biochemical parameters responsible for various body functions and it is deficiency result in impairment of functions induce structural and physiological abnormalities (3). It is well know that variations existing biochemical constituents with regard to sampling procedure, analytical techniques, physical factors ,environmental conditions or variations in breed (4) and to know some advantages for these parameters evaluations to the animal body. The physiological responses of animals to environmental stress during the winter and

summer and their energy balance, showed that seasonal heat and cold stress have profound effects on some serum biochemical parameters(5; 6; 7, 8 ;9; 10; 11,12). (13) found that the values of the normal hematological and biochemical parameters of Hassawi cattle breed in Saudi Arabia within the normal ranges reported in other breed of cattle. (14) showed that there is a significant difference in the concentration of serum total protein , albumin, glucose, cholesterol , calcium, T3 and T4 and activities of AST and CK was seen between hot and cold seasons , whereas the concentration of serum inorganic phosphorus was not significant difference between these two seasons. The aim of this study was to determine the blood serum concentration of some biochemical parameters of male and female of cattle and sheep in marshes of south of Iraq, and give the clear information on the effect of species and sex on these parameters.

Materials and methods

Animals

The animals were randomly selected from fields in the marshes of south of Iraq , the study included 40 animals (8females

and 8males)from cattle with age (1 year – 3 years) and (8females and 8 males)from sheep with age (6 months – 12 months) ,clinical examination revealed the

good health status of these animals and not suffering from malnutrition

Sample collection

Blood samples were collected from jugular vein by vacuotainer apparatus in tube without anticoagulants blood samples were kept for 15 minutes at room temperature and then separated by centrifugation at 3000r.p.m for 15 min and stored at -20c until analysis. Serum concentration of glucose, urea, cholesterol, triglyceride(TG), total protein, albumin, globulin, aspartate amino transferase(AST), alanine amino transferase(AL), alkaline

phosphatase(ALK), lactate dehydrogenase(LDH) were measured by using of kits of Rondax company,UK. The minerals included Ca and K were determined by atomic absorption spectrophotometry

Statistical analysis

The paired sample T test was performed in order to compare the two groups for each of the evaluated parameters. A difference at $p < 0.05$ was considered to be significant. All statistical analysis were performed with statistics Pac version age spss13(15).

Results and Discussion

The serum biochemical values of cattle (males and females) obtained in this study are presented in table (1). The means of biochemical values obtained were within the normal range recorded for other breeds of cattle (16; 17; 18 ; 19), and disagreement with the values obtained by (13). The decrease of glucose concentration in this study could be attributed to the nutritional status of the animals especially in the males was significantly lower than value obtained in the females. The activities of LDH,AST,ALT,and ALP found in the present study were fall within the normal range reported for cattle (20; 21) . Non statistical significant differences in the enzymes activities were found between males and females of cattle lead to that not effect of the sex on these parameters and this results come in agreement with the results which recorded by (2 ; 22). The biochemical parameters of sheep (males and females) are shown in table(2).The serum concentrations of glucose ,urea, creatinine ,TG, total protein ,albumin, glucose , AST, ALT, ALP, LDH ,K and Ca were non significant differences of males sheep when compared with females of sheep, while the cholesterol level was significantly higher($p < 0.05$) in the males compared with the females . In general the values of the above serum parameters obtained in sheeps were within the normal established ranges for sheeps (20; 23; 24 The serum concentration of glucose,

cholesterol, triglycerides, urea, creatinine, total protein , albumin, globulin for males and females in cattle and sheep are shown in table (3). Mean serum cholesterol and TG concentrations were significantly higher in cattle (males and females) when compared with their respective mean concentrations of males and females of sheep respectively. These results which similar findings have been reported by (23 ; 1). The results indicated non significant differences in serum glucose, urea, creatinine , TP, albumin and globulin of males and females of cattle when compared with the values of these parameters of males and females of sheep. The values of above serum parameters obtained for cattle and sheep were within the normal established ranges by (20). The serum enzyme activities of lactate dehydrogenase (LDH), aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphatase (ALP) for cattle and sheep (males and females) are shown in table(3). The activities of LDH, AST and ALP were significantly higher ($p < 0.05$) in the serum of cattle (males and females) when compared with these of males and females of sheep .There is non significant difference in ALT activity between cattle and sheep. These findings indicated that there are differences in normal serum activity values of some enzymes exist between cattle and sheep and these results agreement with the values reported by (1

and 13).The concentration of calcium and potassium are shown in table (3). There are non significant alternative in the levels of calcium and potassium in male and female

cattle compared with the levels of male and female in sheep respectively. These results agreement with previous reports by (20 ,19).

Table (1) : Biochemical parameters of male and female of cattle. Iraq

Parameters	Unit	Male Mean \pm S.E	Female Mean \pm S.E
Glucose	mg/dl	36.6 \pm 2.19b	40.8 \pm 4.48 a
Urea	mg/dl	35 \pm 1,85a	33. 5 \pm 3.50a
Cholesterol	mg/dl	96.12 \pm 3.52a	95.12 \pm 4.15a
TG	mg/dl	70.62 \pm 3.78a	67.7 \pm 3.16a
creatinine	mg/dl	0.65 \pm 1.4a	0.65 \pm 1.06a
Total protein	g/dl	6.4 \pm 5.16a	6.43 \pm 5.62a
Albumin	g/dl	3.25 \pm 0.26a	3.31 \pm 0.81a
Globulin	g/dl	3.13 \pm 0.5a	3.25 \pm 0.59a
AST	IU / liter	54 \pm 9.53a	53.12 \pm 8.26a
ALT	IU / liter	8.8 \pm 1.68a	8.6 \pm 2 .11a
ALP	IU / liter	89.6 \pm 7.95a	90.7 \pm 1.61a
LDH	IU / liter	24.75 \pm 1.82a	26.8 \pm 6.18a

Ca	mmol/l	1.74±0.32a	1.86±0.24a
K	mmol/l	4.07±0.63a	4±0.33a

* The different litters refers to a significant difference at $p>0.05$.

Table (2) : Biochemical parameters of male and female of sheep in south of Iraq

Parameters	Unit	Male Mean ± S.E	Female Mean ± S.E
Glucose	mg/dl	2.15a ± 0.36	5.11a ± 40.7
Urea	mg/dl	32.8 ± 3.64a	2.58±33.7
Cholesterol	mg/dl	.37a ± 66.87±	5.37b±62
TG	mg/dl	2.71a ± 16.1	4.3 a ± 14.8
Creatinine	mg/dl	0.63 ± 0.42a	0.32a± 0.61
Total protein	g/dl	3.52a ± 6.23	2.38a ± 6.18
Albumin	g/dl	0.42a± 3.10	0.24a±3.33
Globulin	g/dl	.46a± 3.12	0.30a± 3.25
AST	IU / liter	4.97a ± 27.4	5.16a ± 26.4
ALT	IU / liter	7.72± 1.16a	± 1.02a 8.2
ALP	IU / liter	1.2.a ± 9.43	±0.6a 8.23
LDH	IU / liter	1.23a ± 19.7	1.54a ± 19.7
Ca	mmol/l	1.76 ± 0.26 a	1.70 ± 0.23a
K	mmol/l	± 0.22 a 4.6	0.28a ± 4.2

* The different litters refers to a significant difference at $p>0.05$.

Table (3) : biochemical parameters of male and female of cattle and sheep in south of Iraq.

Parameters	Unit	81 Male Mean \pm S.E		Female Mean \pm S.E	
		Cattle	Sheep	Cattle	Sheep
Glucose	mg/dl	36.6 \pm 2.19a	36.6 \pm 2.a	40.06 \pm 4.48a	46.8 \pm 4.06a
urea	mg/dl	35 \pm 1.85a	32.8 \pm 3.64a	33.6 \pm 3.50a	33.7 \pm 2.58a
Creatinine	mg/dl	0.65 \pm 1.4a	0.63 \pm 0.42a	0.65 \pm 1.06a	0.61 \pm 0.32a
TG	mg/dl	70.62 \pm 3.78a	16.1 \pm 2.71b	67.7 \pm 3.16a	14.8 \pm 4.3b
Cholesterol	mg/dl	96.12 \pm 3.52a	66.87 \pm 3.37b	95.12 \pm 4.51a	62.5 \pm 2.38b
Total protein	g/dl	6.4 \pm 5.16a	6.23 \pm 3.52a	6.43 \pm 5.62a	6.18 \pm 2.38a
Albumin	g/dl	3.25 \pm 0.26a	3.10 \pm 0.42a	3.31 \pm 0.81a	3.33 \pm 0.24a
globulin	g/dl	3.13 \pm 0.5a	3.12 \pm 0.46a	3.25 \pm 0.59a	3.25 \pm 0.36a
AST	U/L	54 \pm 9.53a	27.7 \pm 4.97b	53.12 \pm 8.26a	26.45 \pm 5.16b
ALT	U/L	8.8 \pm 1.68a	7.72 \pm 1.16a	8.6 \pm 2.11a	8.2 \pm 1.02a
ALP	U/L	89.6 \pm 7.95a	8.23 \pm 0.6b	90.7 \pm 1.61a	9.43 \pm 1.2b
LDH	U/L	24.75 \pm 1.82a	19.7 \pm 1.23b	26.8 \pm 6.83a	19.5 \pm 1.54b
					1.70 \pm 0.23a

Ca	mmol/l	1.74±0.32a	1.76±0.26a	1.68±0.24a	
K	mmol/l	4.07±0.63a	4.6±0.22a	4±0.32a	4.2±0.28a

* The different litters refers to a significant difference at $p > 0.05$.

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دراسة مقارنة لبعض المعايير الكيميوحيوية في مصل ابقار واغنام مناطق احوار جنوب العراق

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الخلاصة

شملت الدراسة الحالية تحديد القيم الطبيعية لبعض المعايير الكيميوحيوية لمصل الأغنام والأبقار في أحوار جنوب العراق والتي تضمنت مستوى الكلوكوز ، اليوريا ، الكرياتين ، الكوليسترول ، الكليسيريدات الثلاثية ، البروتين الكلي ، الألبومين ، الكوبولين ، الكالسيوم،البوتاسيوم،انزيم الاسبارجين أمينوترانسفيراز،انزيم الالنين أمينوترانسفيراز، انزيم الفوسفاتيز القاعدي واللاكتيك ديهادرجينز. بينت النتائج عدم وجود اختلاف معنوي في جميع المعايير المذكورة لذكور الأبقار مقارنة مع الإناث ماعدا تركيز الكلوكوز الذي أزداد معنويًا في الذكور مقارنة مع الإناث. كما ان هنالك زيادة معنوية في تركيز الكوليسترول والبوتاسيوم في ذكور الاغنام مقارنة مع أناتها ، بينما المعايير الاخرى لم تختلف معنويًا .أوضحت النتائج ايضا وجود زيادة معنوية في الكليسيريدات الثلاثية والكوليسترول والاسبارجين امينوترانسفيراز والفوسفاتيز القاعدي واللاكتيك ديهادرجينز عند ذكور وأنث الأبقار مقارنة مع ذكور وأنث الاغنام على التوالي بينما لا توجد اختلافات معنوية في المعايير الأخرى .

الكلمات المفتاحية : المعايير الكيميوحيوية ، الأبقار ، الأغنام ، احوار العراق .