

قسم : طب الحيوان •

كلية الطب البيطري - جامعة أسيوط

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استخدام صورة الدم والمقاييس الكيميائية لمكونات مصل الدم
في بعض حالات الاخفاق التناسلي في قطعان ابقار الفريزيان

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استخدم في هذا البحث عدد ٣٥ بقرة حلب - احتفظ بعشرة أبقار منها في
حالة صحية وتناسلية جيدة - بغرض مقارنة النتائج - بينما استكمل البحث على عدد
١٠ أبقار تعاني من ظاهرة الشيع المتكرر بدون أعراض الكلينيكية وكذلك ١٥ بقرة
عليها علامات التهابات رحمية صديدية وخراريج في جدار الرحم والتساقات، تم
تشخيص الحالات بناء على الفحص الكليني والفحص المهبل والمستقيمي •

استكملت التحاليل على عدد كرات الدم الحمراء والعد الكلي والنوعي لكرات
الدم البيضاء - كما اشتمل على تعيين بعض من مكونات مصل الدم منها الزلال الكلي
والاليومين والجلوبولين والدهون الكلية والدهون الثلاثية والبيروبين وانزيم جاما
جلوتومات ترانسفيريز بالاضافة الى تعيين الصوديوم والبرتاسيوم والكلوريد من السيرم •

افادت النتائج أن هناك ارتفاع ملحوظ في نسبة الدهون الكلية ونسبة الالبويين
والجلوبيولين في الأبقار متكررة الشيع ، أما المقاييس الأخرى فلم يحدث بهاتغيرا
ملحوظا كما أفادت النتائج الى أن ابقار التي تعاني من التهاب في الرحم فان
العد النوعي لكرات الدم البيضاء افاد أن هناك زيادة ملحوظة في نسبة خلايا
اللمفوسيت وكذلك الازينوفيل مع نقص ملحوظ في نسبة الالبويين والجلوبيولين •

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**UTILITY OF BLOOD PICTURE AND SERUM METABOLIC PROFILS
IN CASES ASSOCIATED WITH SOME FORMS OF REPRODUCTIVE
FAILURE IN HOLSTEIN-FRIESIAN DAIRY HERD**

(With Two Tables)

By

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SUMMARY

A total number of 35 holstein-friesian dairy cow - were included in this study. Ten cows were healthy kept as control, 10 cows diagnosed as repeat breeder, and 15 cows were classified according to clinical findings into endometritis, Pyometra, utrine abscess and adhesion. Hematological studies, including Red cell, total and differential leucocytic count and hemaglobin concentration were carried out, total serum protein, serum Albumen serum globulin, A/G ratio, total lipides triglycerides, total Biliruben were also performed. Biochemical studies were also include the estimation of serum sodium potassium and chloride. There were a significant increase in the mean values of total lipids and A/G ratio in repeat breeder cows. In cases associated with pyometra and endometritis there were marked lymphocytosis and Eiosenophilla in addition to marked increase in the mean values of $\frac{1}{2}$ Gt, while A/G ratio was significantly drop.

INTRODUCTION

A part from respiratory affections, parastosis and epidemics, an accumulation of spesific, non contageous or secondary diseases becomes predominant in dairy cattle. The major medical problems are related to fertility disorderes, mastitis, metabolic imbalance and foot diseases (SOMMER and KOWERTZ, 1975).

The above mentioned diseases are sometimes compriseed as "Parturition syndrome" (SOMMER, 1975). Parturition is regarded as the central strain which leads to break-down of the tensed regulatory system whenever the cow is challenged by extranoxis (SOMMER, 1975).

The average herd fertility in most countries is far from the economic optimum, due to the very low heritability estimates for the traditional fertility parameters such as the calving interval and insemination index (GASTEIGER and KRAUSSLICH, 1981). Breeding for fertility improvement using such parameters is an inefficient solution. It can be assumed that fertility is multi-fractional phenomena on whcih needs more biological parameter for characterization, as well as enviromental and manegerial influences. On the other hand modern farming imposes severe strain onthe metabolism of dairy herd (PAYNE, *et al.* 1970). Every effort is made to secure high yields at minimum cost and less incidence of metabolic diseases.

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Metabolic profile test in bovine practice was directed to metabolic health of individual dairy herd (BOSTEDT, et al. 1976 and ROWLANDS, et al. 1977). Further use of blood chemistry in relation to fertility (ROWLANDS, et al. 1980), stage of lactation, pregnancy and reproductive performance (LARSON, et al. 1980).

The aim of this investigation is to study the extent of the changes in some parameters in relation to some forms of reproductive failure in friesian-dairy herd to throw some light on the nature of the existing reproductive problems.

MATERIAL and METHODS

A total of 35 holstein-friesian cows were included in this investigation. The animals were classified according to the breeding history and the clinical examination into the following groups:

- Group I:** Ten apparently healthy cows without evidence of reproductive disturbance kept as controls.
- Group II:** Composed of ten cows diagnosed as repeat breeders (failed to conceive after being inseminated for three successive times. The clinical examination failed to detect any lesions which may explain the cause of conception failure.
- Group III:** Composed of 15 cows suffering from endometritis, pyometra or single or multiple large uterine abscess and adhesions between the uterus and the surroundings.

Two blood samples were collected from each animal by means of jugular veinpuncture in two separate centrifuge tubes. The first one was anticoagulated using heparin sodium as anticoagulant (1000 u/ml) and used for hematological purpose. The second sample was collected without anticoagulant for serum separation.

Hematological studies: include Red cell count, total white cell count, hemoglobin estimation. All these parameters were carried out using electronic hematology counter cell-Dyne-squi turner 3000, while differential leucocytic count was carried out by ordinary method of hematology.

Serum total protein, serum albumen, triglycerides, total lipids, γ -GT and serum biliruben were determined using reagent test kits Bio-Merux - France, such parameters were measured spectrophotometry by the use of Bye - Unicum computerized double beam spectrophotometer model 8800, according to the selected wave length of each parameter.

Serum sodium and potassium were measured by means of Corning - Flame photometer 400.

Serum chloride was determined by the of corning chloride meter 925.

Statistical analysis of the obtained data was carried out by the methods adopted after SNEDECOR and COCHRAN, 1974).

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RESULTS

The mean values of serum protein, serum chemistry and serum electrolytes in Group (I), Group (II) and Group (III) are illustrated in table (1) and table (2).

Herd history:

A holstein - Friesian dairy herd composed of 420 cows, belonged to El-Diabat station for meat and milk production (Sohag Governorate). Some of cows were in the second or third season of lactation while some others were calved for the first time. Seventy cows were suffering from forms of infertility.

Information concerning the breeding history of each animal including age, number of previous calvings, date and condition of the last parturition, last service, frequency of the oestrus cycle and character of the vaginal discharge were recorded. Rectal and vaginal examination were carried out.

DISCUSSION

The idea of the metabolic profile test is not new in the Veterinary practice. In bovine practice also blood analysis are familiar diagnostic aids in the maintenance of herd health.

Several attempts have been made to define the normal chemistry of dairy cattle (PAYNE, and HEALY, 1968 and SOMMER, 1969). The data described in this investigation on normal values in healthy Friesian cattle are in a good agreement with the data reported by the previously mentioned authors. Screening the data collected from repeat breeder cows, there were no significant changes in mean values of R.B.Cs., W.B.Cs., hemoglobin and differential leucocytic count. There were also no significant changes in the mean values of total serum protein, triglycerides, γ -GT, bilirubin between healthy and repeat breeder cows, while there was a significant ($P/0.05$) increase in A/G ratio in repeat breeder cows. Similar results were reported by ROWLAND, *et al.* (1977) and ROSSIGNEUX (1978). In addition, there was a significant ($P/0.05$) increase in the concentration of total lipids in repeat breeder cows. Such observation was in agreement with REID, *et al.* (1979) and TAINURIER, *et al.* (1984).

Analysis of serum electrolytes (Na, K and Cl) showed some variations in the mean values of such parameters between healthy and repeat breeder cows without diagnostic significance. It could be concluded that the variations in blood and serum constituents between apparently healthy and repeat breeder cows were not significant such results could be attributed to the healthy condition of repeat breeder cows which showed no specific clinical findings, and no evidence of changes in the general health condition. Moreover, some of repeat breeder cows appeared to be fat and this may explain the cause of increase in the mean value of total lipids.

The data of hemogram in cases associated with reproductive failure (endometritis, pyometra and adhesions) indicated that the mean value of Red cell count was slightly but not significantly dropped (6.63 million/cu), such observation was recorded by EL-BAGDADY (1979). The total number of leucocytes was significantly ($P/0.05$) increased. SCHALM (1975) and EL-BAGDADY (1979) recorded similar results in cows affected with cervicitis and/or endometritis.

The mean value of neutrophils was significantly ($P/0.05$) decreased and marked ($P/0.05$) lymphocytosis was also observed in some individuals. Eosinophilia was also present. Interpretation of the results of differential leucocytic count in this group indicated more or less

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chronic bacterial infection of the genital organs, eosinophilia in some cases indicated a regenerative changes during the course of the treatment. Furthermore, the mean values of serum total protein and serum bilirubin and total lipids in this group were remained un-changed if compared with healthy group. Other component such as A/G ratio was significantly ($P/0.05$) decreased. This decrease was mainly due to the marked increase in percentage of globulin fraction associated with the infection of the genital tract. On the other hand the mean value of γ -GT was markedly increased. Such elevation could be attributed to the secondary effect of bacterial toxins on liver cells which causes more or less some destruction of liver cells and consequently increase in concentration of enzyme activities.

It is also of interest here to mention that, although there was statistically significant variations in mean values of some serum electrolytes (Na, K and Cl) they were considered to be of no biological significance.

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Table (1)
Mean values of blood picture in Healthy, repeat breeder cows and cows with pyometra or endometritis

Animals group	No. of cases	Diff. leucocytic count							
		R.BCs T/L	W.B.Cs G/L	HB G/L	Neutrophil %	Eisono	Baso	Lymphocytes	Monocytes
Group I controle	10	7.51+0.23 (6.30-8.40)	10.83+ 0.29 (9.40-12.30)	11.92+ 0.41 (10.30-13.70)	36.5+0.79 (32 - 19)	14.0+0.73 (10 - 19)	45.4+0.60 (43 - 48)	5.1+0.72 (2 - 8)	
Group II Repeat breeders	10	7.72+0.15 (6.95-8.30)	11.7 + 0.83 (10.30-13.60)	13.09+ 0.32 (11.78-14.80)	37.2+1.07 (32 - 42)	9.5+0.56* (7 -12)	45.4+1.04 (40 - 50)	6.6+0.54* (4 - 8)	
Group III pyometra and adhesions	15	6.63+0.22* (5.2 -8.75)	15.49+ 0.69* (10.70-19.60)	11.58+ 0.21 (10.30-12.40)	18.8+2.82** (9 - 43)	16.6+1.03* (10 - 24)	62.2+3.45** (35 - 68)	2.27+0.29 (1 - 3)	

+ = Standard error
* = P / 0.05
** = P / 0.01

Table (2)
The mean values of serum parameters in healthy, repeat breeder cows and cows with pyometra or endometritis

Animals group	No. of cases	Total proteins g/L	Alb. g/l	Glob. g/L	A/G %	Triglycerides mml
Group I	10	92.95 \pm 2.84 (84.63-110.44)	38.83 \pm 0.46 (37.23-40.93)	53.92 \pm 2.61 (47.7 -69.8)	0.72 \pm 0.03 (0.51-0.87)	0.691 \pm 0.1 (0.266-1.22)
Group II	10	87.49 \pm 1.3 (82.16- 93.16)	43.98 \pm 1.43* (38.07-50.70)	43.51 \pm 1.16* (39.49-52.53)	1.09 \pm 0.11* (0.72-1.95)	0.58 \pm 0.1 (0.34 -1.32)
Group III	15	94.25 \pm 2.78 (80.13-115.35)	28.59 \pm 1.47* (20.40-39.38)	65.65 \pm 2.07** (52.50-86.23)	0.44 \pm 0.02* (0.32-0.59)	0.83 \pm 0.06* (0.305-1.30)

Count (2)

Animals group	No. of cases	GT ul	Biliruben mm/l	Total lipids g/L	Na mml/L mmol/L	K mml/L mmol/L	CL mml/L mmol/L
Group I	10	12.7 \pm 0.67 (10 - 15)	2.67 \pm 0.138 (2.4 -3.7)	4.49 \pm 0.135 (3.9 -5.5)	151.9 \pm 2.01 (140 -160)	6.04 \pm 0.175 (5.3 -6.72)	96.5 \pm 0.58 (94 -99)
Group II	10	15.5 \pm 0.85 (12 - 20)	2.36 \pm 0.13 (1.89-3.06)	12.02 \pm 0.81** (8.8 -15.15)	143.9 \pm 1.4 (138 -151)	5.41 \pm 0.19 (4.3 -6.1)	109.2 \pm 1.58 (99 -116)
Group III	15	22.0 \pm 1.68 (11.0-34)	3.83 \pm 0.62 (1.4 -9.9)	6.72 \pm 0.68 (4.1 -12.6)	-	-	-

\pm = Standard error
* = P / 0.05
** = P / 0.01

TABLE I

The following table shows the results of the analysis of the samples of the various types of paper used in the manufacture of the various types of paper.

Sample No.	Type of Paper	Weight (g)	Length (cm)	Width (cm)	Area (cm ²)	Volume (cm ³)
1
2
3
4
5

Sample No.	Type of Paper	Weight (g)	Length (cm)	Width (cm)	Area (cm ²)	Volume (cm ³)
6
7
8
9
10