RELATIONSHIP BETWEEN BLOOD CONSTITUENTS, MILK PRODUCTION AND REPRODUCTIVE PERFORMANCES IN LACTATING BUFFALOES

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ABSTRACT

Sixteen lactating buffaloes were used to study the variation of certain blood constituents in the late pregnancy and early lactation, milk compositions and their relationships with some reproductive performances. The results cleared that the blood RBCs, Hb, protein, glucose, cholesterol and inorganic phosphorus concentrations decreased significantly ($P < 0.05$) during the last three months of pregnancy, but the concentrations of blood WBCs, alkaline phosphatase, GOT and GPT activities increased. During the first three months after calving the previous blood parameters were increased and WBCs and inorganic phosphorus decreased with the advance of lactation period.

Yields of milk and fat started with a low level at the first month postpartum and recorded the highest level at the second months of lactation, while milk protein, casein and ash percentages recorded the highest value at the 3rd months of lactation. Furthermore, milk fat and moisture percentages gave the highest value at the first month after calving. Days open and interval from calving to first oestrus were 124.62 ± 6.82 and $57.69 + 4.39$ days, respectively while number of services per pregnancy was 2.62 ± 0.15 times.

Reproductive performances studied were negatively correlated with RBCs, Hb, glucose and inorganic phosphorus but WBCs, alkaline phosphatase, GOT and GPT were positively correlated either before or after calving. On the other hand, monthly milk yield, milk protein, casein, ash and moisture percentages were lowest and positively correlated with the previous reproductive parameters, while fat percentage and its yield were significantly and negatively correlated.

Key words: Blood parameters, milk components, reproductive performance, before and post calving.

INTRODUCTION

Some investigators have used certain blood constituents in dairy animals to predict milk performance with the assumption that feed constituents become a part of the blood before being converted into milk (Kitchenham *et al.*, 1975 and Butler *et al.*, 1996).

The duration of the postpartum a cyclic period correlated with the daily milk production at the peak of lactation, whereas ovarian dysfunction was more frequently in high yielding cows (Nakao *et al.*, 1992).

Reproduction is the main factor limiting production efficiency of dairy cattle, lack of knowledge of the right time, lack proper managemental in adverse climates, delayed resumption of postpartum ovarian activity are some of the factors lowering the reproductive value of their animals (Pieterse *et al.*, 1990).

Therefore, the present study was carried out to get more information concerning the changes in blood constituents before and after parturition, as well as milk production at early lactating buffaloes. Furthermore, to correlate the previous blood and milk parameters and reproductive performances.

MATERIALS AND METHODS

The present work was carried out at the Experimental Farm of the Department of Animal Production, Faculty of Agriculture, Kafr El-Sheikh, Tanta University. Sixteen buffalo cows were used for 6 months (3 months prepartum and 3 months postpartum). The experimental animals were in their 2nd and 3rd lactating season. Their average body weights ranged from 400 to 500 kg. Animals were fed according to NRC (1988) requirements. They grazed berseem clover (*Trifolium alexandrinum*) during winter and spring and then fed on rice straw to complete their requirements. Chemical composition of feed staffs are presented in Table (1). Water was freely available throughout the experiment.

Table (1): Feed ingredients and chemical composition of the experimental rations.

Feed stuffs	Chemical composition (on DM basis %)					
	Organic matter	Crude protein	Crude fiber	Ether extract	NFE	Ash
Concentrate feed mixture (CFM)	89.46	16.82	8.82	3.47	60.35	10.36
Rice straw	82.21	3.35	33.99	1.28	43.58	17.77
Berseem clover	84.85	16.61	29.80	1.27	37.17	15.14

Blood samples were collected monthly from the jugular vein of each animal during the experimental period. Ethylene diaminetetra acetate (EDTA) was added into a clean and dry test tube as anticoagulant to determine red (RBCs) and white (WBCs) blood cells and haemoglobin concentrations (Hb). To another test tube free of EDTA, blood was collected to get serum which was separated by centrifugation at 3000 r.p.m for 15 minutes and then stored at -20°C until the determination of total protein, cholesterol, glucose, inorganic phosphorus, GOT, GPT and alkaline phosphatase as described by Varoley (1976).

At the 1st, 2nd and 3rd months postpartum, milk yield was recorded and samples were collected from both morning and evening handily milking, good mixed and prepared for the determination of percentages of protein, casein, fat, ash and moisture as described by (AOAC, 1990).

Reproductive performances included days open, interval from calving to first oestrus, number of insemination per conception and interval from first oestrus to conception were observed and calculated.

The obtained data were statistically analysed using General Linear Models Procedure Adapted by SPSS (1997) for User's Guide (one way ANOVA model). Where appropriate means were separated using Duncan's multiple range tests.

RESULTS AND DISCUSSION

In the present study, the levels of blood RBCs, Hb, protein, glucose, cholesterol and inorganic phosphorus concentrations recorded the highest values at the 3rd months prepartum and thereafter they significantly decreased to measure the lowest values at the 1st month before calving, which were in agreement with Patil and Deshpande (1979), who reported that at the 8th weeks before calving the blood protein and glucose concentrations were deceased until calving. In the same trend, Prakash and Tandon (1979) and Soliman *et al.* (1995) found that the concentrations of cholesterol and lipids fell gradually as parturition approached and rose steeply after parturition. This change may be due to hormonal influences probably played a major role, both thyroid hormones and oestrogens influenced cholesterogenesis during pregnancy to some extent. While, Allam and Mottelib (1981) found that there was no regular pattern of change in blood serum cholesterol concentration neither during prepartum nor postpartum.

Moreover, in the experimental lactating buffaloes it was found that blood WBCs, alkaline phosphatase, GOT and GPT activities increased significantly at the same previous period to measure the highest values at the 1st month before calving (Table, 2). Results from this study agree with that reported by Salem *et al.* (1979), who found an increase in activity of blood GOT during the last period of gestation in cattle and buffaloes may be the result of increasing requirements for foetus to synthesize new tissues or accelerating the metabolic rate of protein synthesis needed for faetal growth and milk production. While other investigators found that the elevated values of these enzymes during the late pregnancy and early lactation may be due to liver dysfunction (Rowlands *et al.*, 1977).

Table (2): Changes in certain blood constituents at late pregnancy and early lactating in buffaloes (Mean ± SE).

Period / Blood parameters	Before calving (months)			After calving (months)			Overall means		Average overall means
	1	2	3	1	2	3	Before calving	After calving	
RBCs (N x 10^6/mm^3)	4.99 ± 0.14^{Ba}	5.74 ± 0.12^{Cb}	5.94 ± 0.13^{Cb}	4.44 ± 0.05^{Ab}	4.49 ± 0.10^{Ab}	4.90 ± 0.12^{Ba}	5.56 ± 0.09	4.61 ± 0.06	5.08 ± 0.07
WBCs (N x 10^3/mm^3)	6.38 ± 0.16^{ABa}	6.06 ± 0.21^{Aab}	5.56 ± 0.27^{Ab}	9.36 ± 0.28^{Cb}	8.79 ± 0.48^{CB}	7.24 ± 0.49^{Ba}	6.00 ± 0.13	8.46 ± 0.27	7.23 ± 0.20
Haemoglobin (g%)	11.74 ± 0.38^{ABa}	12.78 ± 0.33^{BCa}	14.46 ± 0.39^{Db}	11.61 ± 0.00^{Aa}	13.01 ± 0.00^{Cb}	13.39 ± 0.00^{CDb}	12.99 ± 0.72	12.67 ± 0.00	12.83 ± 0.18
Protein (g%)	8.31 ± 0.23^{BCa}	8.64 ± 0.18^{Cab}	9.22 ± 0.21^{Db}	6.72 ± 0.11^{Aa}	7.87 ± 0.11^{Bc}	8.38 ± 0.16^{CDb}	8.72 ± 0.12	7.22 ± 0.21	8.27 ± 0.11
Glucose (mg%)	54.99 ± 1.90^{BCa}	60.06 ± 1.21^{Cb}	59.02 ± 1.10^{Cab}	39.54 ± 1.23^{Aa}	54.81 ± 2.40^{BCb}	53.12 ± 2.08^{Bb}	58.02 ± 0.88	49.16 ± 1.19	53.59 ± 0.97
Cholesterol (mg%)	155.42 ± 5.81^{BCa}	159.42 ± 8.74^{Ca}	180.28 ± 6.45^{Db}	127.59 ± 6.04^{A}	133.49 ± 6.17^{A}	138.47 ± 6.65^{AB}	165.04 ± 4.3	133.19 ± 03.61	149.11 ± 03.22
Alkaline phosphatase(IU/L)	75.36 ± 3.52^{A}	74.56 ± 0.5.16^{A}	74.69 ± 6.33^{A}	133.16 ± 0.343^{Ba}	144.84 ± 4.81^{Bcab}	151.28 ± 5.81^{Cb}	74.87 ± 2.90	143.09 ± 2.91	108.98 ± 4.05
GOT (I.U/L)	45.75 ± 1.78^{Bb}	43.19 ± 2.76^{Abb}	37.1 ± 0.16^{Aa}	64.13 ± 2.60^{C}	70.38 ± 3.30^{CD}	71.50 ± 2.70^{D}	42.03 ± 1.25	68.67 ± 1.68	55.35 ± 1.72
GPT (I.U/L)	25.94 ± 2.00^{BCb}	22.63 ± 1.18^{ABab}	19.19 ± 0.84^{Aa}	29.75 ± 1.91^{CD}	30.50 ± 2.12^{CD}	33.81 ± 2.05^{D}	22.58 ± 0.09	31.35 ± 1.18	26.97 ± 0.86
Inorganic phosphorus (mg%)	5.86 ± 0.27^{BC}	6.12 ± 0.28^{BC}	6.46 ± 0.18^{C}	5.99 ± 0.24^{BCb}	5.57 ± 0.26^{Bb}	4.68 ± 0.21^{Aa}	6.15 ± 0.14	5.42 ± 0.15	5.78 ± 0.11

A, B, C means in row for each character with different superscripts significantly differ ($P < 0.05$)
a, b, c means in row for before and after separately with different superscripts significantly differ ($P < 0.05$)

On the other hand, all the previous blood parameters increased during the first three months after calving in lactating buffaloes except the values of WBCs and inorganic phosphorus which were adversely affected the levels at the 1st month postpartum and then decreased gradually until the end of the experimental period. This tendency agreed with Farrag *et al.* (1984), who reported that the values of RBCs, Hb and glucose declined after parturition till the 3rd weeks of lactation and thereafter increased. This may be due to the production of colostrum which is rich in proteins specially gama globulins which is necessary for the defence mechanism of the newly born calf (Butler *et al.,* 1996). In the same trend, Abd El-Moneim *et al.* (1990) and El-Shora (2001)in buffaloes, Metwally *et al.* (2000) in Friesian cattle, observed that blood protein, lipids, cholesterol, glucose, GOT and GPT activities increased with advancing of lactation period postpartum. This change may be due to stress of lactation and its hormones or to secretion of ATCH which secreted by the adrenal cortex under condition of stress of lactation (Nakao *et al.,* 1992).

The present results in Table (3) indicated that the levels of monthly milk yield, milk protein, casein percentages, fat yield and ash percentage started with a low levels at the 1st month postpartum and then increased significantly ($P < 0.05$) to record the highest values at the 2nd or the 3rd months of lactation after calving. On the other hand, milk fat and moisture percentages measured the highest levels at the 1st month after calving and decreased at the 2nd months of lactation and then again increased at the 3rd months of lactation. The present results are in agreement with Abd El-Moneim *et al.* (1990), who reported that milk yield started at a low level during the first month of lactation and then increased to reach the maximum value at the second or the third months after parturition and then declined afterwards. This changes may be due to variations in the concentration of hormones that are usually associated with parturition and the onset of both milking and pregnancy. Moreover, in the same trend for lactating buffaloes, these results are supported by those reported by Soliman *et al.* (1995) and Metwally (1996). Increasing the level of milk production during the first month of lactation may be attributed to the increasing of prolactin secretion and other metabolic hormones which accelerate the animals ability for milk production and thereafter decrease with the advance of lactation period may be due to decreasing efficiency of the udder secratory cells and the hormonal status convenients to milk production during stage of gestation (Rowlands *et al.,* 1977).

Table (3): Milk yield and milk components in early lactating buffaloes (Mean ± SE).

Period / Milk parameters	Postpartum period (month)			Overall mean
	1	2	3	
Milk yield (kg/month)	203.75±4.46 ^{a}	255.00±5.16 ^{b}	236.67±2.87 ^{c}	231.67±3.92
Protein %	4.10±0.08 ^{a}	4.38±0.05 ^{b}	4.50±0.06 ^{b}	4.33±0.04
Casein %	3.42±0.07 ^{a}	3.68±0.03 ^{b}	3.71±0.08 ^{b}	3.60±0.04
Fat %	6.86±0.12 ^{b}	6.44±0.15 ^{a}	6.48±0.13 ^{ab}	6.59±0.08
Fat yield (kg/month)	13.8±0.57 ^{a}	17.17±0.91 ^{b}	15.14±0.56 ^{a}	15.15±0.56
Ash %	0.97±0.02 ^{ab}	0.91±0.01 ^{a}	1.01±0.3 ^{b}	0.96±0.01
Moisture %	84.64±0.17 ^{b}	83.26±030 ^{a}	84.38±0.34 ^{b}	84.08±0.18

a, b, c means in row with different superscripts significantly differ ($P < 0.05$).

It seems from the data presented in Table (4) that the days open, interval from calving to first oestrus and interval from first oestrus to conception were 124.62 ± 6.82, 57.69 ± 4.39 and 60.69 ± 3.91 days, respectively, while the numbers of insemination per conception was 2.62 ± 0.15 times in lactating buffaloes. In this field, El-Wardani *et al.* (2000) reported that the intervals from calving to first postpartum oestrus, first postpartum insemination and fertile service were 107.5 ± 10.9, 108.6 ± 10.1 and 133.1 ± 11.8 days, respectively for the Egyptian buffaloes, while the number of services required for conception was 1.2 times.

Table (4): Some reproductive performances in lactating buffaloes.

	Days open	Interval from calving to first oestrus	No. of insemination per conception	Interval from first oestrus to conception
Means ± SE	124.62 ± 6.82	57.69±4.39	2.62±0.15	60.69±3.91

On the other hand, Hewett (1974) gave shorter intervals and number of services per conception for the Swedish dairy herds, while Mikhail (1979) reported longer intervals to first service postpartum to record about 196.32 days. A possible cause of these differences is differences in the methods, frequency and timing of oestrus detection (Bulman and Wood, 1980).

Days open, interval from calving to first oestrus, number of inseminations per conception and interval from first oestrus to conception were negatively correlated with blood RBCs, Hb, cholesterol, glucose and inorganic phosphorus concentrations in lactating buffaloes either before or after calving, while WBCs, alkaline phosphatase, GOT and GPT activities were positively correlated (Table, 5). Results from this study are supported by Hewett (1974), who reported that the high total blood protein, high urea-N, low blood glucose and low Hb concentrations were associated with lowered fertility parameters. Moreover, Awad *et al.* (1981) observed that the fertility of the lactating buffaloes tended to be reduced if inorganic phosphorus falls, since phosphorus deficiency may cause inhibits growth and maturation of follicles possibly due to failure in FSH (follicle stimulating hormone) secretion (Prasad and Rao, 1997) or may be due to its effect on the anterior pituitary secretion (Jahan and Myenuddin, 1996). In contrary, there is not relationship between fertility and blood inorganic phosphorus in cattle as reported by Rowlands *et al.* (1977). Recently, El-Darawany and Marai (2001) reported that the blood Hb and RBCs were significantly lower but the count of WBCs, eosinophile and monocytes were significantly higher in buffaloes and cows requiring three or more services per conception.

The previous reproductive performances under consideration were found to be slightly and negatively correlated with blood serum protein during the last three months of pregnancy but it was positively and significantly correlated with such component during postpartum. These results agreed with those of Hewett (1974), who found that the values of globulin increase significantly in the first three weeks following calving, while albumin/globulin ratio (in case of liver dysfunction) was lower in cows requiring four or more services per conception. It was early found that cows fed protein in excess of their requirements recorded a high incidence of postpartuient endometritis and anoestrus and these were accompanied with higher serum GOT activity (Ramakrishna, 1996).

Data in Table (6) showed the correlation coefficient values between some reproductive performances on one hand and both milk yield and milk composition on the other. Milk yield, milk protein, casein, moisture and ash percentages were slightly and positively correlated with days open, interval from calving to first oestrus, number of inseminations per conception and interval from first oestrus to conception but milk fat percentage and milk fat yield were significantly and negatively correlated. In this trend, Thatcher and Wilcox (1973) reported 13.1, 14.0 and 15.5 days for period from parturition to first ovulation and 28.4, 33.1 and 36.9 days from parturition to first standing oestrus, depending upon milk production (low, medium or high). Moreover, El-Keraby and Schilling (1976) found a positive correlation between the level of milk production and the occurrence of silent heat and insignificant positive correlation coefficients of 0.13, 0.1 and 0.06 were found between milk yield and the intervals from calving to complete uterine involution, first ovulation and first detected oestrus, respectively. Similar results were reported by Britt (1988). Such conflict may have resulted from differences in the genetic potential and the level of production of animals used (Oltenacu *et al.*, 1991).

Table (5): Relationship between blood constituents at before and after calving and some reproductive performances in buffaloes.

Blood parameters	Reproductive performance			
	Days open	Interval from calving to first oestrus	No. of insemination per conception	Interval from first oestrus to conception
Before calving				
RBCs	-0.26	-0.23	-0.23	-0.22
WBCs	0.16	0.26	0.08	0.02
Haemoglobin	-0.01	-0.07	-0.08	-0.16
Protein	-0.07	-0.06	-0.12	-0.17
Cholesterol	-0.41*	-0.46*	-0.49*	-0.63**
Glucose	-0.04	-0.19	-0.19	-0.16
Alkaline phosphatase	0.25	0.33*	0.26	0.41*
GOT	0.21	0.30*	0.09	0.29*
GPT	0.02	0.01	0.06	0.29*
Inorganic phosphorus	-0.30*	-0.40*	-0.16	-0.19
After calving				
RBCs	-0.19	-0.17	-0.19	-0.26
WBCs	0.12	0.07	0.25	0.25
Haemoglobin	-0.11	-0.15	-0.12	-0.13
Protein	0.31*	0.28*	0.39*	0.30*
Cholesterol	-0.32*	-0.34*	-0.46*	-0.52**
Glucose	-0.27	-0.23	-0.42	-0.56**
Alkaline phosphatase	0.26	0.29*	0.17	0.09
GOT	0.17	0.23	0.12	0.04
GPT	0.03	0.10	0.07	0.28*
Inorganic phosphorus	-0.07	-0.14	-0.04	-0.25

* significantly at $P < 0.05$, ** Significantly at $P < 0.01$

Table (6): Relationship between milk components and some reproductive performances in buffaloes.

Milk components	Reproductive performance			
	Days open	Interval from calving to first oestrus	No. of insemination per conception	Interval from first oestrus to conception
Milk yield (kg/month)	0.14	0.21	0.11	0.03
Fat %	-0.3*	-0.4*	-0.3*	-0.3*
Fat yield (kg/month)	-0.4*	-0.31*	-0.3*	-0.17
Milk protein %	0.02	0.05	0.03	0.04
Casein %	0.03	0.04	0.001	0.06
Moisture %	0.07	0.03	0.23	0.26
Ash %	0.19	0.27	0.17	0.14

* Significantly at $P < 0.05$

It is concluded that the blood parameters estimated three months before and after calving as well as milk yield and its components would appear to be useful as a practical index of potential fertility in Egyptian buffaloes.

REFERENCES

Abd El-Moneim, A.E.; A.I. Aboulnaga; H.M. Gado and M.A. El-Ashry (1990). Changes in some blood parameters as a function of stage and number of lactation in milking buffalo. Egypt J. Anim. Prod., 27: 107.

Allam, F. and A.A. Mottelib (1981). The influence of health conditions on the blood composition during late pregnancy and early lactation periods in dairy cows. Assiut J. Agric. Sci., 12: 199.

AOAC (1990). Association of Official Analytical Chemists Official Methods of Analysis. 15th Edition, Washington, D.C.

Awad, Y.L.; R.H. Youssif; M.F. Mikhail and M.A. Eid (1981). Relationships between certain blood biochemical parameters and fertility in Egyptian buffaloes (1) Macroelements and total proteins. Agric. Res. Rev. Cairo, 59: 179.

Britt, J.H. (1988). Reproductive efficiency in dairy cattle as related to nutrition and the environment. Proc. 1988 Dairy Herd Management Conf., Georgia.

Bulman, D.C. and P.D. Wood (1980). Abnormal patterns of ovarian activity in dairy cows and their relationship with reproductive performance. Anim. Prod., 30: 177.

Butler, W.R.; J.J. Calaman and S.W. Beam (1996). Plasma and milk urea nitrogen in relation to pregnancy rate in lactating dairy cattle. J. Anim. Sci., 74: 858.

El-Darawany, A.A. and I.F. Marai (2001). Repeat breeding and its amelioration in cattle and buffaloes. Proceeding 2nd International

Conf. on Anim. Prod. and Health in Semi Arid Areas. p. 25, El-Arish-North-Sinai, Egypt.

EL-Keraby, F. and E. Schilling (1976). Effect of feeding of cows during the late gestation on the reproductive performance in the early postpartum period. International Cong. on Anim. Reprod. and Artificial Insemination, pp. 361.

El-Shora, M.A. (2001). Utilization of watermelon vines residues in feeding lactating buffalo cows. M.Sc. Thesis, Fac. Agric., Tanta Univ., Kafr El-Sheikh.

El-Wardani, M.A.; H. Almahdy; A.S. Tabana and M.K. Hathout (2000). Reproductive performance of the Baladi cows and buffaloes under traditional management system in Egyptian small holdings. Pro. Conf. Anim. Prod. In the 21st Century, Sakha, 18-20 April, p. 325.

Farrag, A.A.; I.A. Salem; A. Gomaa and A.M. Hafez (1984). Studies of serum enzymatic activity and blood picture in relation to uterine involution in cows and buffaloes. Assiut Vet. Med. J., 12: 218.

Hewett, C. (1974). On the causes and effects of variations in the blood profile of Swedish dairy cattle. The 1st Ed. Stockholm, Sweden.

Jahan, S. and M. Myenuddin (1996). Zeranol and flavomycin as a therapy for repeat breeder Friesian cows under Egyptian condition. Proceeding 8th Annual Congress of Egyptian Society for Anim. Prod. and Fertility, Cairo, Egypt, 158.

Kitchenham, B.A.; G.J. Rowlands and H. Shorbagi (1975). Relationships of concentrations of certain blood constituents with milk yield and age of cow in dairy herds. Res. Vet. Sci., 18: 249.

Metwally, A.M. (1996). Relationships between stage of lactation and some milk and blood constituents in lactating buffaloes. J. Agric. Res. Tanta Univ., 22: 466.

Metwally, A.M.; A. Shitta and E.M. Abdel-Raouf (2000). Productive and reproductive performance of lactating Friesian cows supplemented with yeast culture. J. Agric. Res. Tanta Univ., 26: 32.

Mikhail, M.F. (1979). Studies on ovarian inactivity in buffaloes in A.R.E. Thesis for M.D. Vet., Cairo Univ.

Nakao, T.; M. Moriyoshi and K. Kawata (1992). The effect of postpartum ovarian dysfunction and endometritis on subsequent reproductive performance in high and medium producing dairy cows. Theriogenology, 37: 341.

NRC (1988). Nutrient Requirements of Domestic Animals. No. 9. National Research Council Washington, D.C.

Oltenacu, P.A.; A. Frick and B. Lindhe (1991). Relationship of fertility to milk yield in Swedish cattle. J. Dairy Sci., 74: 264.

Patil, J.S. and B.R. Deshpande (1979). Changes in body weight, blood glucose and serum proteins in relation to the appearance of postpartum oestrus in Gir cows. J. Reprod. Fert., 57: 525.

Pieterse, M.C.; M.A. Taverne and A.H. Willemse (1990). Reproductive activity of the cow in the postpartum period. Br. Vet. J., 140: 269.

Prakash, B.S. and R.N. Tandon (1979). A note on the effect of the late pregnancy and early lactation on blood serum cholesterol and total lipids of Holstein x Tharparkar first lactation cows. Indian J. Anim. Sci., 49: 308.

Prasad, K.S. and S.V. Rao (1997). Blood mineral profile of anestrus and repeat breeder cross bred cows. Indian J. Anim. Nut., 14: 135.

Ramakrishna, K.V. (1996). Microbial and biochemical profile in repeat breeder cows. Indian J. Anim. Reprod., 17: 30.

Rowlands, G.T.J.; W. Little and B.A. Kitchenham (1977). Relationships between blood composition and fertility in dairy cows. J. Dairy Sci., 44: 17.

Salem, I.A.; A.A. Mottelib and G.A. Abdel-Hafez (1979). Nutritional studies of buffaloes during dry period. III. Variation in the activity of some serum enzymes. Assiut Vet. Med. J., 6: 63.

Soliman, A.S.; M.S. Gado and M.H. Abou El-Fadl (1995). Factors affecting milk yield and composition in Freisian x Balady crossbred cows. Egyptian J. Appl. Sci., 10: 601.

SPSS (1997). SPSS base 7.5 for Windows, User's Guide; SPSS Inc.

Thatcher, W.W. and C.J. Wilcox (1973). Postpartum estrus as an indicator of reproductive status in the dairy cow. J. Dairy Sci., 56: 608.

Varoley, V. (1976). "Practical Clinical Biochemistry" 4th Edition, New Delhi, India.

الملخص العربى

العلاقة بين مكونات الدم وتركيب اللبن مع بعض مقاييس الكفاءة التناسلية فى الجاموس الحلاب

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استخدم فى هذه الدراسة ستة عشر جاموسه حلابة وذلك لدراسة التغيرات فى مكونات الدم فى نهاية مدة الحمل والفترات الأولى من الحليب وكذلك دراسة مكونات اللبن وعلاقة تلك المكونات ببعض مقاييس الكفاءة التناسلية.

وأوضحت النتائج أن كرات الدم الحمراء والهيموجلوبين والبروتين والجلوكوز والكلسترول والفوسفور الغير عضوى تقل معنويا كلما اقترب الحيوان من ميعاد الولادة ولكن كرات الدم البيضاء وإنزيمات الالكالين فوسفاتيز و GPT, GOT تزداد كلما اقترب ميعاد الولادة للحيوانات أما بعد الولادة فبدأت تزداد جميع مركبات الدم السابقة خلال الثلاثة أشهر التالية للولادة ماعدا كرات الدم البيضاء والفوسفور الغير عضوى الذى انخفض مع التقدم فى موسم الحليب.

وبالنسبة لمكونات اللبن فإن محصول اللبن وكمية الدهن فبدأت بمستويات منخفضة عند أول شهر بعد الولادة ولكنها وصلت لأقصاها عند الشهر الثانى للحليب بينما نسبة البروتين والكازين والرماد سجلت أعلى قيم عند الشهر الثالث بعد الولادة بينما نسبة الدهن والرطوبة سجلت أعلى قيم لها بعد الشهر الأول للولادة.

كما لوحظ أن فترة التلقيح المخصب والفترة من الولادة لأول شياع سجلت حوالى ١٢٤,٦٢ ± ٦,٨٢ و ٥٧,٦٩ ± ٤,٣٩ يوم على التوالى بينما عدد التلقيحات اللازمة لكل حمل حوالى ٢,٦٢ ± ٠,١٢ مرة.

سجلت المقاييس التناسلية المدروسة ارتباط سلبى مع كرات الدم الحمراء والهيموجلوبين والجلوكوز والفسفور الغير عضوى بينما كان الارتباط ايجابى مع كرات الدم البيضاء والالكالين فوسفاتيز و GPT. GOT سواء قبل أو بعد الولادة. بينما كانت العلاقة بين مقاييس الكفاءة التناسلية مع محصول اللبن ونسبة البروتين والكازين والرماد والرطوبة إيجابية ولكنها مع نسبة الدهن وكميته سلبية وعالية المعنوية.

ومن هذه الدراسة اتضح أن مكونات الدم خلال فترة الثلاثة شهور السابقة للولادة ونفس الفترة بعدها وكذلك مكونات اللبن خلال الثلاثة أشهر التالية للولادة يكون بعضها مهم فى تحديد مدى كفاءة الحيوان تناسليا.