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INFLUENCE OF STORAGE AND TYPE OF SAMPLE ON BLOOD UREA LEVEL OF HEALTHY GOATS

(With One Table and 3 Figs.)

By

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تأثير الحفظ ونوع العينة على معدل اليوريا فى دم الماعز السليمة

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تم قياس معدل اليوريا فى كلاً من مصل وسائل البلازما والدم الكلى لعدد ستة من الماعز تراوحت أعمارها بين ٢ ـ ٣ سنوات وأهتمت الدراسة بتأثير نوع وكذلك طريقة حفظ العينة عند درجة حرارة الغرفة (٣٢ ـ ٣٧م) وبوضعها على رف الثلاجة (٤م) وكذلك فى النيب فريز (ـ ٢٠م) على معدل اليوريا وذلك بقياسها فى الحال وبعد يوم وثلاثة وسبعة أيام لتحديد أنسب وقت لتحليل العينة وكذلك أنسب عينة لقياس معدل اليوريا فى دم الماعز

SUMMARY

Blood urea levels have been estimated in whole blood, blood plasma, and blood serum of six clinically healthy female goats (2-3 years age).

The study was carried out to investigate the possible alterations in urea levels in blood samples as well as the influence of storage of those blood samples at room temperature (32-37°C), Door of refrigrator (4°C) and in deep freezing (-20°C). Urea levels in estimated samples were done at once and after one, three and seven days of sampling.

INTRODUCTION

Urea diffuses readily into all body fluids so that at one time it was thought that the concentration in the water of plasma and cells was the same but it has been shown that the concentration in the cells is greater than in the plasma, possibly some is bound to haemoglobin (VARLY et al., 1980). The auther added also that the higher concentration in plasma (and so in serum) is only slight greater than in the whole blood. He concluded also that the use of serum or plasma is perferable to whole blood in determination of blood urea.

Urea nitrogen constitutes ordinarily about 45% of the blood non-protein nitrogen (N.P.N.). Most methods for determination of urea content of the blood are based upon incubation with preprations of the enzyme urease which catalyzes the conversion of urea to ammonium carbonate (HAWK'S, 1979). Also the auther added that urea nitrogen in the whole blood varies from 8 to 18 mg% and in serum are 1 to 2 mg% higher.

MERK (1982) recorded that normal urea level in whole blood varies from 18-36 mg/dL. WOOTTON (1974) recorded that the blood plasma contains 15 to 45 mg/dL of urea.

The clinical significance of urea determination arises from the fact that an elevated concentration in blood may be associated with impairement of renal function (COLES, 1986).

TOLLERSRUD (1969) concluded that blood serum sample should not be kept at room temperature (20-30°C) for more than 3 days to avoid the risk of bacterial growth, and he added that Storage for long periods required a deep freezing.

MERK (1980) reported that storage of blood serum sample for long period could be considered as a source of errors consequently analysis should be carried out as soon as possible to overcome many biochemical reaction occurring in the used sample.

BUSH (1975) can concluded that blood serum can be stored at room temperature (20-30°C) for up 24 hours without deteriorations, in the cool part of the refrigerator (4°C) for up to four days in freezing compartment (-10°C) and for one week in deep freezing (-15 to -20°C).

The aim of this work to through light upon the influnece of both different types of storage and time of analysis upon urea level in whole blood, blood plasma and blood serum of clinically healthy goats.

MATERIALS and METHODS

Six female goats (2-3 years) were choised for determination of blood urea nitrogen. All animals were proved to be clinically healthy by both laboratory and clinical methods of examination. Blood samples were obtained from Jugular vien through vien puncture. All samples (whole blood, blood piasma, and blood sera) were analysed on the sampling day at once and then stored at three different temperature, at room temperature (32-37°C); in the refrigerator (4°C) and in the deep freezer (-20°C). All samples were analysed daily for seven successive days. Blood urea nitrogen levels were estimated using test kits supplied from Biomeriex (BAINS & FRANCE) and after the method described by CHANEY and MARBACH (1962).

Statistical analysis of the obtained data was performed according to the method of KALTON (1967).

RESULTS

Mean values of urea in whole blood, blood plasma and blood serum at different type of storage are demonstrated in table (1) and illustrated in Figs. (1, 2 & 3).

STORAGE, TYPE BLOOD SAMPLE

Table (1): Mean values of blood urea in whole blood, blood plasma and blood serum of examined goats.

Type of storage	Time of analysis /Days	Whole blood mg%	Blood plasma mg%	Blood serum mg%
At Room temperature (32-35°C)	0	36.8±2.36	21.6±0.84	26.17±5.8
	1	48.7±7.3**	32.2±6.3**	36.0 ±9.3
	3	56.4±12.4**	20.9±6.1	32.7 ±15.1
	7	40.3±12.7	38.3±12.7*	46.1 ±20.7*
Door of refrig. (-4 °C)	0	36.8±2.4	21.6±0.8	26.17±5.8
	1	38.3±9.7*	33.6±6.8**	36.7 ±9.4
	3	63.1±11.3**	31.7±3.7	38.7 ±10.9*
	7	50.8±9.8**	43.9±16.4**	60.7 ±19.8**
Deep freez (-20 °C)	0	36.8±2.35	21.6±0.83	26.17±5.8
	1	48.7±9.2*	31.3±4.04**	39.1 ±9.5*
	3	56.5±11.2**	32.8±5.6**	35.8 ±9.6
	7	51.2±7.4**	50.9±2.9**	61.8 ±15.5**

Mean : ± Standard deviation. * : Significant. ** : Highly significant.
0 : At Once. 1,3,7 = After one, three and sevendays.

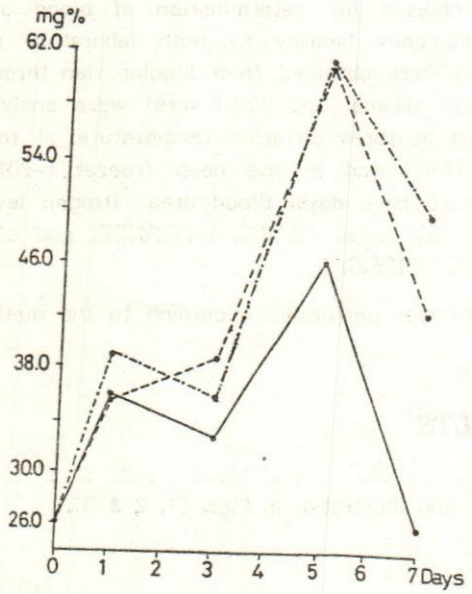

Fig. 2_ Blood Urea level in blood serum of examined goats

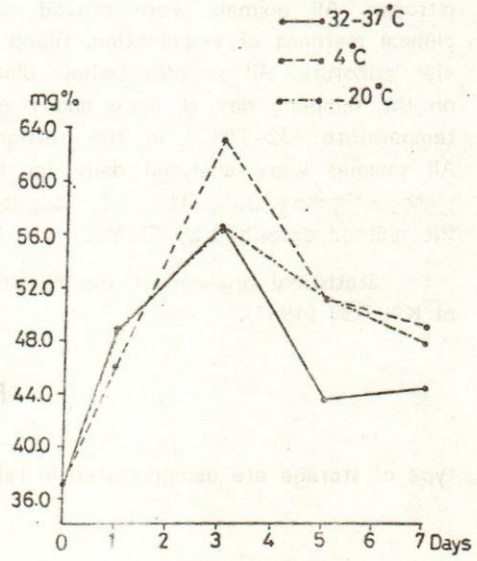

Fig. 1_ Blood Urea level in whole blood of examined goats

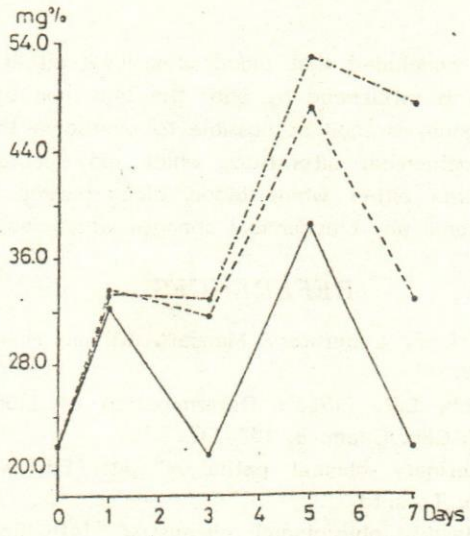

Fig. 3 - Blood Urea level in blood plasma of examined goats

DISCUSSION

Blood urea level in the whole blood which was analysed at once recorded 36.8±2.35 mg/dL, a figure which is coincided with those previousely obtained by MERK (1982) which recorded that blood urea level in the whole blood varies from 18-36 mg/dL.

The level in sample stored at room temperature (32-37°C) for 1,3,7 days showed a significant elevation in blood urea concentration at once, and three days then a non-significant elevation was evident after 7 days. Meanwhile a significant elevation was evident in samples stored in the refrigerator (4°C) and the deep freezer (-20°C) allover the period of analysis. This elevation in blood urea level can be attributed to the increased bacterial activity which leads to an increase in the enzymatic activity (TOLLERSRUD, 1969).

The obtained level of urea in plasma was in agreement with those obtained by WOOTTON (1974) which recorded that plasma normally contains 15 to 45 mg/dL of urea.

The obtained urea level in the blood serum coincided with those previousely obtained by COLES (1986) -13-28 mg/dL in caprine. the elevation in urea level in the blood sera stored at refrigerator and deep freezer indicated that biochemical

analysis of blood serum sample should be carried out as soon as possible to overcome many biochemical reaction which might occur in the blood serum sample (MERK, 1980).

Finally it could be concluded that blood urea level either in whole blood, blood plasma or in blood serum is influenced by both the type and time of storage samples. Thus analysis should be done as soon as possible to overcome the errors in the results as a consequence of biochemical alterations which may occurr. Also we advise to analyse the sample for urea either whole blood, blood plasma or blood serum at the day of collection to overcome any biochemical changes which may occurr.

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