

EFFECTS OF HAEMATINICS ON BODY WEIGHT AND CERTAIN HAEMATOLOGICAL VALUES IN BLACK BENGAL GOATS

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ABSTRACT

Effects of haematinics on body weight and certain haematological values were studied in nine female Black Bengal goats of 1 to 2 years old, divided into three groups (A, B, & C), each consisting of 3 goats during the period from 15 January to 28 February 2002. Goats of group B treated orally with copper sulphate and ferrous sulphate @ 50 mg and 200 mg / head / day respectively and the goats of group C, in addition to copper and ferrous sulphate were treated orally with cobalt sulphate @ 1 mg / head / day along with IM injection of Vit-B₁₂ (B₅₀ Forte[®], Square) @ 5 ml / goat every 15 days interval for a period of 45 days whereas group A served as untreated control. Results showed that the body weight gain were significantly ($p < 0.05$) increased in the haematinics treated groups B and C (13.57 ± 3.63 g and 12.83 ± 1.01 g respectively) in comparison to control (13.30 ± 1.40 g) at 45 days of treatment. Haematological examination showed significantly ($p < 0.01$) increased haemoglobin (10.47 ± 0.13 g% and 10.77 ± 0.12 g%), packed cell volume (31.67 ± 0.33% and 32.33 ± 0.33%), total erythrocyte count (13.90 ± 0.12 and 14.78 ± 0.26 10⁶ / mm³), mean corpuscular volume (22.78 ± 0.12 μ³ and 21.88 ± 0.16 μ³), mean corpuscular haemoglobin (7.53 ± 0.05 and 7.28 ± 0.05 μg) and mean corpuscular haemoglobin concentration (33.05 ± 0.08 and 33.30 ± 0.09%) in the treated groups B and C at 45 days of treatment respectively. The present findings indicate that the supplementation of haematinics could be used in the improvement of general health condition as well as the haematological parameters.

Key words : Haematinics, body weight, haematological values, Black Bengal goats

INTRODUCTION

Over the years goats have been an important tool for poverty alleviation and social empowerment of the poor people in Bangladesh. The native Black Bengal goats constitute majority of the goat population in Bangladesh. Black Bengal goats are popular because of their high quality meat and skin with their highest fertility rate and multiple kidding efficiency. In spite of the fact profitable goat rearing in Bangladesh is faced by several problems like shortage of feed, poor management, housing, prevalent diseases and nutritional deficiency. Due to deficiency of Vitamin B₁₂, folic acid, iron, copper, cobalt in feed anaemia is developed. Vitamin B₁₂ is necessary for the maturation of erythrocytes. In ruminant, Vitamin B₁₂ is synthesized by rumen microflora where cobalt is essential for maintenance of normal number and types of these microflora (McDonald *et al.*, 1987). The deficiency of iron causes anaemia in rapid growing suckling due to low content of iron in milk. More than half of the iron in the animal body is found as constituent of hemoglobin (Radostits *et al.*, 1994). Copper is an essential element for a number of biochemical functions such as iron utilization and hemoglobin formation (Mertz, 1987). Chandra *et al.* (2000) investigated that the supplementation of haematinics containing copper, iron, cobalt, Vit-B₁₂ resulted in the removal of primary cause of anaemia and subsequent treatment promoted erythropoiesis. Limited informations are available on the haematological parameters of goats raised under grazing condition. The present paper describes the effect of haematinics on body weight and haematological parameters in Black Bengal goats.

MATERIALS AND METHODS

Nine Black Bengal female goats, aged between 1 to 2 years and body weight of 7.5 kg to 14.5 kg were selected from Animal Nutrition Farm, BAU, Mymensingh and used in this experiment to study the effects of haematinics on body weight and certain haematological parameters during the period from 15 January to 28 February 2002. The goats were grouped randomly as A, B and C, consisting of 3 goats in each group. Group A considered as control and group B and C as treatment group. They were kept in separate pens under good housing condition and were allowed to graze day time on the naturally grown weeds and grasses in the BAU campus. Goats of group B were treated orally with combination of copper and ferrous sulphate @ of 50 mg and 200 mg / head / day respectively and, the goats of group C were treated orally with combination of copper, ferrous and cobalt sulphate @ 50 mg, 200 mg and 1 mg / head / day respectively daily for 45 days along with IM injection of Vit-B₁₂ (B₅₀ Forte inj., Square) @ 5ml / goat every 15 days interval. Body weight and haematological parameters were recorded at pre-treatment (day 0) and at 15th, 30 and 45 days of post-treatment with haematinics. Blood sample was collected from jugular vein in oxalated glass vials and haematological studies (TEC, Hb, PCV, MCV, MCH, MCHC) were performed within 2 hours of blood collection according to the methods described by Coffin (1955).

Effects of haematinics in Black Bengal goats

Data obtained were analyzed statistically for mean, standard error and analysis of variance according to the standard procedures as described by Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

The effect on body weight gain of three different groups of goats is presented in Table 1. Haematological values especially haemoglobin (Hb), packed cell volume (PCV), total erythrocyte count (TEC), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) at different days of treatment like day 0, day 15, day 30 and day 45, are presented in Table 2.

Table 1. Effect of haematinics on body weight in Black Bengal goats (Mean SE)

Groups	Haematinics	Dose / goat / day	Body weight gain (g)			
			Day 0	Day 15	Day 30	Day 45
A (n = 3)	Control	–	12.90 ± 1.40	13.08 ± 1.38	13.17 ± 1.30 ^a	13.30 ± 1.40 ^a
B (n = 3)	Copper sulphate	50 mg	12.97 ± 3.79	13.12 ± 3.76	13.30 ± 3.73 ^b	13.57 ± 3.63 ^b
	Ferrous sulphate	200 mg				
C (n = 3)	Copper sulphate	50 mg	11.95 ± 0.80	12.17 ± 0.88	12.48 ± 0.90 ^b	12.83 ± 1.01 ^b
	Ferrous sulphate	200 mg				
	Cobalt sulphate	1 mg				
	Vit-B ₁₂	5 ml [*]				

*Vit-B₁₂ injection @ 5 ml / goat was given every 15 days interval, Means having different superscripts differed significantly (p < 0.05).

Table 2. Effect of hematoinics on haematological parameters in goat (Mean ± SE)

S / N	Parameters	Unit	Days of observation	Groups (n = 3)		
				A (Control)	B (CuSO ₄ + FeSO ₄)	C (CuSO ₄ + FeSO ₄ + CoSO ₄ + Vit-B ₁₂)
1.	TEC	10 ⁶ / mm ³	0	12.60 ± 0.06 ^a	13.07 ± 0.11 ^b	13.21 ± 0.25 ^b
			15	12.67 ± 0.09 ^a	3.17 ± 0.09 ^b	13.00 ± 0.15 ^b
			30	12.78 ± 0.04 ^a	3.72 ± 0.17 ^b	13.81 ± 0.18 ^b
			45	12.63 ± 0.09 ^a	3.90 ± 0.12 ^b	14.78 ± 0.26 ^b
2.	Hb	g%	0	8.50 ± 0.06 ^a	9.14 ± 0.18 ^b	9.32 ± 0.11 ^b
			15	8.58 ± 0.04 ^a	9.50 ± 0.12 ^b	9.76 ± 0.16 ^b
			30	8.68 ± 0.02 ^a	0.00 ± 0.12 ^b	10.32 ± 0.90 ^b
			45	8.65 ± 0.05 ^a	10.47 ± 0.13 ^b	10.77 ± 0.12 ^b
3.	PCV	%	0	26.00 ± 0.58	28.00 ± 0.58	28.00 ± 0.58
			15	27.00 ± 0.58 ^a	8.67 ± 0.33 ^b	29.67 ± 0.33 ^b
			30	27.33 ± 0.88 ^a	0.67 ± 0.33 ^b	31.33 ± 0.33 ^b
			45	27.00 ± 0.58 ^a	1.67 ± 0.33 ^b	32.33 ± 0.33 ^b
4.	MCV	μ ³	0	20.63 ± 0.36	21.41 ± 0.27	21.47 ± 0.20
			15	21.31 ± 0.31	21.76 ± 0.11	21.97 ± 0.21
			30	21.38 ± 0.66 ^a	2.35 ± 0.08 ^b	22.05 ± 0.11 ^b
			45	21.37 ± 0.38 ^a	2.78 ± 0.12 ^b	21.88 ± 0.16
5.	MCH	μμg	0	6.75 ± 0.01 ^a	6.99 ± 0.01	7.24 ± 0.06 ^b
			15	6.78 ± 0.01 ^a	21 ± 0.06 ^b	7.23 ± 0.10 ^b
			30	6.79 ± 0.03 ^a	7.29 ± 0.02 ^b	7.26 ± 0.05 ^b
			45	6.85 ± 0.02 ^a	7.53 ± 0.05 ^b	7.28 ± 0.05 ^b
6.	MCHC	%	0	32.71 ± 0.51 ^a	2.65 ± 0.27	33.32 ± 0.32 ^b
			15	32.81 ± 0.59 ^a	3.14 ± 0.20 ^b	32.91 ± 0.18
			30	31.83 ± 0.96 ^a	2.61 ± 0.19 ^b	32.92 ± 0.07 ^b
			45	32.06 ± 0.54 ^a	3.05 ± 0.08 ^b	33.30 ± 0.09 ^b

Means having different superscripts differed significantly (p < 0.01).

At 30 days of treatment, the average body weight gain in group B (copper sulphate + ferrous sulphate) and group C (copper sulphate + ferrous sulphate + cobalt sulphate + Vit-B₁₂) were 13.30 ± 3.73 g and 12.48 ± 0.90 g respectively, whereas in group A (Control) it was 13.17 ± 1.30 g. There were significant ($p < 0.05$) differences among the three groups. After treatment for 45 days, statistical analysis revealed that significant ($p < 0.05$) increase in body weight gain were recorded in group B (13.57 ± 3.63 g) and group C (12.83 ± 1.01 g) than that of control group A (13.30 ± 1.40 g) comparing the previous respective body weight of day 0 and day 15 after treatment. Between the two treated groups, comparatively higher body weight gain was recorded in group C that was treated with cobalt sulphate and Vit-B₁₂ in addition of copper sulphate and ferrous sulphate. The increased body weight might be due to the influence of haematinics. This observation is in agreement with the earlier reports of Lind and Blum (1994) and Vellema *et al.* (1997).

The mean values of Hb, PCV, TEC, MCV, MCH and MCHC were differed significantly ($p < 0.01$) among the three groups. All the haematological values of the treated groups were increased significantly ($p < 0.01$) with the increase of age and haematinic treatment than that of control, but there were no significant differences of the values between the two treated groups. The increased haematological values might be due to the influence of haematinics on haemopoietic organs and erythropoiesis mechanism. Increased haematological values in the groups treated with haematinics resemble the findings of Drawdy and Matrone (1968).

It is therefore, suggested that the supplementation of haematinics is useful in improving health condition and haematological parameters in goats.

REFERENCES

1. Chandra S, Chakrabarti A, Sarker S and Dhara K (2000). Anaemia in Black Bengal goats and its chemotherapy. *Indian Journal of Animal Health* 39 : 33–35.
2. Coffin DL (1955). *Manual of Veterinary Clinical Pathology*. 3rd edn., Comstock Publishing Associates Inc. Ithaca, New York.
3. Mertz W (1987). *Trace Elements in Human and Animal Nutrition*. 5th edn., Academic Press, New York.
4. Drawdy RP and Matrone G (1968). Copper, molybdenum in sheep and chicks. *Journal of Nutrition* 95 : 191–201.
5. Lind F and Blum JW (1994). Growth performance, haematological traits, meat variables and effects of treadmill and transport stress in veal calves supplied different amounts of iron. *Journal of Veterinary Medicine* 41 : 333–342.
6. McDonald P, Edwards RA and Greenhalgh JFD (1987). *Minerals. In : Animal Nutrition*. 4th edn., English Language Book Society, London.
7. Radostits OM, Blood DC and Gay CC (1994). *Veterinary Medicine*. 8th edn., English Language Book Society, London.
8. Snedecor GW and Cochran, WG (1980). *Statistical Methods*. 7th edn., The Iowa State University Press, Ames, Iowa, USA.
9. Vellema P, Moll L, Barkema HW and Schukkan YH (1997). Effect of cobalt supplementation on serum vitamin B₁₂ levels, weight gain and survival rate in lambs grazing on cobalt deficient pastures. *Veterinary Quarterly* 19 : 01–05.