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EFFECTS OF HAEMATINICS ON BODY WEIGHT AND CERTAIN HAEMATOLOIGCAL VALUES IN SHEEP

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ABSTRACT

Effects of haematinics on body weight gain and certain haematological values were studied on nine sheep of 1 to 2 years old, divided into three groups (A, B & C), each consisting of 3 sheep during the period from 15 January to 28 February 2002. Sheep of group B were treated with copper sulphate and cobalt sulphate @ 50 mg and 1 mg / head / day respectively and the sheep of group C, in addition to copper and cobalt sulphate, were treated orally with ferrous sulphate @ 200 mg / head / day along with IM injection of Vit-B_{12} (B_{50} Forte®, Square) @ 5 ml / sheep 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 (12.67 ± 2.33 g and 13.57 ± 2.24 g respectively) in comparison to control (9.37 ± 0.58 g) at 45 days of treatment. Haematological examination showed significantly ($p < 0.01$) increased haemoglobin (9.33 ± 0.42 g% and 10.0 ± 0.06 g%), packed cell volume (29.0 ± 0.58 % and 30.0 ± 0.58 %), total erythrocyte count (9.67 ± 0.22 and 10.27 ± 0.25 10^6 / mm^3), and mean corpuscular haemoglobin concentration (32.26 ± 0.83 and 32.28 ± 0.53%) 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 improving the general health condition in sheep and the haematological values.

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

INTRODUCTION

Over the years, sheep have been an important tool for poverty alleviation and social empowerment of the poor people in Bangladesh. The native sheep constitutes majority of the sheep population in Bangladesh. Sheep are popular because of their wool and their highest fertility rate. Inspite of the fact profitable sheep 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 B_{12}, folic acid, iron, copper, cobalt in feed anaemia is developed. Vitamin B_{12} is necessary for the maturation of erythrocytes. In ruminant, Vitamin B_{12} 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 haemoglobin (Radostits *et al.*, 1994). Copper is an essential element for a number of biochemical functions such as iron utilization and haemoglobin formation (Mertz, 1987). Chandra *et al.* (2000) investigated that the supplementation of haematincs containing copper, iron, cobalt, Vit-B_{12} resulted in the removal of primary cause of anaemia and subsequent treatment promoted erythropoiesis. Limited information are available on the haematological parameters of sheep raised under grazing condition. The present paper describes the effect of haematinics on body weight and haematological parameters in sheep.

MATERIALS AND METHODS

Nine female sheep, aged between 1 to 2 years and body weight of 7.5 kg to 14.5 kg were collected 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 sheep were grouped randomly as A, B and C consisting of 3 sheep 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. Sheep of group B were treated orally with combination of copper and cobalt sulphate @ 50 mg and 1 mg / head / day respectively and, 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 vitamin B_{12} (B_{50} Forte Inj, Square) @ 5 ml / sheep 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).

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

Body weight and haematological parameters of different groups of sheep are presented in Table 1 and 2.

Table 1. Effect of haematinics on body weight in sheep (Mean ± SE)

Groups	Haematinics	Dose / Sheep / Day	Body weight (kg)			
			Day 0	Day 15	Day 30	Day 45
A (n = 3)	Control	–	08.43 ± 0.50	08.68 ± 0.51[a]	08.97 ± 0.52[a]	09.37 ± 0.58[a]
B (n = 3)	Copper sulphate	50 mg	11.33 ± 2.30	11.73 ± 2.28[b]	12.13 ± 2.19[b]	12.67 ± 2.33[b]
	Cobalt sulphate	1 mg				
C (n = 3)	Copper sulphate	50 mg	12.40 ± 2.35	12.83 ± 2.17[b]	13.23 ± 2.12[b]	13.57 ± 2.24[b]
	Ferrous sulhpate	200 mg				
	Cobalt suphate	1 mg				
	Vit- B_{12}	5 ml*				

*Vitamin B_{12} injection @ 5 ml / sheep was given every 15 days interval, Means having different superscripts differed significantly ($p < 0.05$)

Table 2. Effect of haematinics on haematological parameters in sheep (Mean ± SE)

S / N	Parameters	Unit	Days of observation	Groups (n = 3)		
				A (Control)	B ($CuSO_4 + CoSO_4$)	C ($CuSO_4 + FeSO_4 + CoSO_4 +$ Vit-B_{12})
1.	TEC	10^6 / mm^3	0	8.50±0.06	8.36 ±0.17	8.48 ±0.23
			15	8.60±0.06[a]	8.80±0.16	9.10±0.20[b]
			30	8.67±0.06[a]	9.22±0.16[b]	9.70±0.21[b]
			45	8.63±0.09[a]	9.67±0.22[b]	10.27±0.25[b]
2.	Hb	g%	0	8.18±0.06	8.17±0.09	8.30 ±0.03
			15	8.29±0.06	8.60 ±0.06	8.82 ±0.02
			30	8.27±0.07[a]	8.87±0.38	9.48 ±0.02[b]
			45	8.36 ±0.07[a]	9.33±0.42[b]	10.00±0.06[b]
3.	PCV	%	0	25.33±0.33	26.00±0.58	27.00±0.58
			15	26.33±0.33[a]	27.00±0.58	28.00±0.58[b]
			30	26.00±0.58[a]	28.33±0.88[b]	29.67±0.67[b]
			45	27.00±0.58[a]	29.00±0.58[b]	30.00±0.58[b]
4.	MCV	μ^3	0	29.80±0.24	31.10±0.19	31.86 ± 0.35
			15	30.62 ±0.23	30.68 ±0.16	31.44±0.92
			30	30.00±0.47	30.73 ±0.43	30.58±0.19
			45	31.23±0.34	29.99±0.10	30.24±1.06
5.	MCH	$\mu\mu g$	0	9.63±0.05	9.77±0.11	9.81±0.29
			15	9.64±0.06	9.78±0.12	9.70±0.22
			30	9.54±0.03	9.61±0.29	9.79±0.23
			45	9.69±0.03	9.64±0.26	9. 75±0.20
6.	MCHC	%	0	32.31±0.20	31.43±0.37	30.77±0.77
			15	31.47±0.19	31.84±0.44	31.52±0.71
			30	31.83±0.43	31.29±0.84	32.00±0.68
			45	30.95 ± 0.43[a]	32.26 ± 0.83[b]	32.28±0.53[b]

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

At 15 days of treatment, the average body weight in group B (copper sulphate + cobalt sulphate) and group C (copper sulphate + ferrous sulphate + cobalt sulphate + Vit-B_{12}) were 11.73 ± 2.28 g and 12.83 ± 2.17 g respectively, whereas 8.68 ± 0.51 g was in group A (Control). There were significant ($p < 0.05$) differences among the three groups. At 30 days of treatment, significantly ($p < 0.05$) increased body weight gain was recorded in group B (12.13 ± 2.19 g) and C (13.23 ± 2.12 g). After treatment for 45 days, statistical analysis revealed that significant ($p < 0.05$) increase in body weight gain were recorded in group B (12.67 ± 2.33 g) and group C (13.57 ± 2.24 g) than that of control group A (09.37 ± 0.58 g) comparing the previous respective body weight of day 15 and day 30 of treatment. Between the two treated groups, comparatively higher body weight gain was recorded in group C that was treated with ferrous sulphate and Vit-B_{12} in addition of copper sulphate and cobalt sulphate. The increased body weight in the treated groups might be due to the influence of haematinics. This observation is in agreement with the earlier reports of Vellema *et al.* (1997).

The values of Hb, PCV, TEC and MCHC of the treated groups were increased significantly ($p < 0.01$) with the increase of age and haematinic treatment than that of control. Between the two treated groups, significant ($p < 0.01$) increase of Hb, PCV and TEC were found in group C that was treated with ferrous sulphate and Vit-B_{12} in addition of copper sulphate and cobalt sulphate. No significant differences were found among the three groups in terms of MCV and MCH. The increased haematological parameters might be due to the positive effects of haematinics on haemopoietic organs and erythropoiesis. Increased haematological parameters of the present findings resemble to that of Drawdy and Matrone (1968).

It is therefore, suggested that the supplementation of haematinics is useful in improving general health condition in sheep if they are used in proper rate and ratio.

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