

Short communication

EFFECTS OF IODINE FORMULATIONS ON BODY WEIGHT AND HAEMATOLOGICAL PARAMETERS IN BEEF CATTLE

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ABSTRACT

The present research was carried out on indigenous beef cattle to study the effect of iodine formulations on body weight and hematology by using iodide salt and Lugol's iodine irrespective of feed and management in dairy farm, Bangladesh Agricultural University in collaboration with the Department of Pharmacology, Bangladesh Agricultural University for the period of 2 months from August to September 2005. A total of 20 male bull of 2 years old were selected, weighed ranged from 80-100kg and randomly divided into four groups as A, B, C and D. Group A was treated with non-iodide salt @ 25mg/kg b.wt, group B treated with iodide salt @ 25mg/kg b.wt, group C treated with IV injection of 2% Lugol's iodine @ 10 mg/kg b. wt and group D were kept as control. After treatment, blood parameters and body weight were recorded on 30th and 60th day. Highest weight gain was recorded in Lugol's iodine treated group, about 7.09% for weight gain compared with the control group. The result reveals that use of iodine formulation is an effective way of increasing meat production and weight gain in indigenous beef cattle of Bangladesh.

Key Words: Meat production, body weight, indigenous beef cattle, iodide salt, Lugol's iodine

INTRODUCTION

Livestock has direct impact in our national economy about 6.5% of total gross domestic product (GDP) and about 13% of total foreign exchange earning (GoB,1991) by supplying egg, meat, milk as animal protein, provides biofertilizer and a source of draught power. The conditions of meat production in indigenous cattle are not satisfactory. Total meat production of indigenous cattle is only 170 metric ton (FAO, 2000). The cause beyond this is costly price of the feed and fodder, resulting protein, vitamin and mineral deficiencies in livestock ration causing less production. Iodine supplement as salt and iodide preparation may play an effective role in this context. The present study describes the efficacy of iodide salt and Lugol's iodine on hematology and weight gain in indigenous beef cattle.

MATERIALS AND METHODS

The experiment was conducted in dairy farm, Bangladesh Agricultural University in collaboration with the Department of Pharmacology, Bangladesh Agricultural University for the period of 2 months from August to September 2005.

Selection and management of experimental animal

A total of 20 indigenous beef cattle were selected from dairy farm, Bangladesh Agricultural University. The animals were 2 years old and weighed ranged from 80-100 kg. The animals were randomly classified into four groups each consisting of 5 namely group A, B, C and D. Initial body weight (on day 0) of group B, C and D were recorded respectively. Group A were fed with non-iodide salt @ 25mg/kg bd. wt. daily with water. Treatment with iodide salt (Confidence® salt) @ 25mg/kg bd. wt. daily with water and IV injection of Lugol's iodine @ 10mg/kg b.wt. twice in a month for group B and C respectively and the experiment conducted for 60 days. Group D was kept as control. During the whole experiment, the bulls were mainly stall-fed. Attempts were made to keep all the animals under same management condition.

Hematological parameters

Blood samples were collected directly from the jugular vein of each cattle prior to day 0 and at 30 days interval after administration of iodine preparations by using disposable syringe in test tube containing anti coagulant (Potassium oxalate, Ammonium oxalate). These test tubes were labeled with date and tag number of animal. The hematological parameters were determined as per method cited by Lamberg and Rothstein (1977).

Weight gain of the animals

Weight gain of all experimental animals was recorded on day 0, day 30 and day 60 post treatment. The weights were taken in morning before feeding and recoded.

Statistical Analysis

All data were recorded carefully and subjected to statistical analysis according to Steel and Torrie (1980) to analysis the variance in completely randomized design (CRD). The results were assayed by the least significant difference test in MSTAT computer program Completely Randomized Design.

RESULTS AND DISCUSSION**Effect on blood parameters**

Total Erythrocyte Count (TEC- $10^6/\text{mm}^3$), Hemoglobin content (Hb, g %) and the Packed Cell Volume (PCV %) were increased on 60 days of post-treatment in group C, B, A respectively where as Erythrocyte Sedimentation Rate (ESR, mm/hr) was decreased and Total Leukocyte Count (TLC- $10^3/\text{mm}^3$) was normal in all groups (Table 1).

Table 1. Effect of common salt, iodide salt and Lugol's iodine on blood parameters in beef cattle

Parameters	Treatment		Group A	Group B	Group C	Group D
Total erythrocyte counts (TEC- $10^6/\text{mm}^3$)	Pre-treatment	Day 0	5.18 ± 1.05	5.50 ± 1.03	5.50 ± 1.01	5.64 ± 1.02
	Post-treatment	Day 30	5.82 ± 0.83	5.65 ± 0.64	5.78 ± 0.72	5.20 ± 1.07
		Day 60	5.98 ± 0.71	6.75 ± 0.85	7.34 ± 0.78	5.10 ± 1.10
Total leukocyte counts (TLC- $10^3/\text{mm}^3$)	Pre-treatment	Day 0	7.24 ± 1.10	7.12 ± 1.01	7.24 ± 1.10	7.36 ± 1.02
	Post-treatment	Day 30	7.23 ± 1.50	7.16 ± 1.25	7.25 ± 1.50	7.37 ± 1.60
		Day 60	7.35 ± 1.26	7.15 ± 1.26	7.21 ± 1.70	7.40 ± 170
Hemoglobin (g %)	Pre-treatment	Day 0	8.00 ± 1.80	8.00 ± 1.80	8.00 ± 1.80	8.00 ± 1.80
	Post-treatment	Day 30	8.50 ± 1.57	8.90 ± 1.67	9.40 ± 1.67	7.50 ± 0.45
		Day 60	9.00 ± 1.50	9.70 ± 1.50	10.00 ± 1.60	7.40 ± 0.45
PCV (%)	Pre-treatment	Day 0	25.00 ± 5.21	25.00 ± 5.83	24.00 ± 4.13	26.60 ± 5.52
	Post-treatment	Day 30	26.00 ± 5.51	26.00 ± 5.52	26.00 ± 5.62	26.30 ± 5.72
		Day 60	26.20 ± 5.55	27.25 ± 5.52	28.00 ± 5.56	26.10 ± 5.83
ESR (mm/hr)	Pre-treatment	Day 0	1.70 ± 0.96	1.70 ± 0.96	1.80 ± 0.98	1.60 ± 0.94
	Post-treatment	Day 30	1.50 ± 0.80	1.30 ± 0.65	1.25 ± 0.84	1.75 ± 0.55
		Day 60	1.25 ± 0.84	1.00 ± 0.65	0.70 ± 0.45	1.85 ± 0.75

Effect of Common salt, Iodide salt and Lugol's iodine on hematological parameters

The hematological change in cattle was determined at pre- and post-treatment with common salt, iodide salt and Lugol's iodine. The total erythrocyte count (TEC) in all treated groups increased when compared with control group. Hemoglobin percent increased in all group but in control hemoglobin per cent decrease. Packed Cell Volume (PVC) was increased in Group A, B and C but slightly increase in Group D. The total leukocyte

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count (TLC) normal in all groups and erythrocyte sedimentation rate (ESR) was decreased in Group A, Group B and Group C respectively where as ESR increased in Group D. The variation might be due to effect of iodine formulation on hemopoiesis. The present findings are supported by other researchers. (Shcheglov *et al.*, 1989; Spiridon *et al.*, 1988; Zygmunt, 1987).

Table. 2 Effects of common salt, iodide salt and Lugol's iodine on live weight of beef cattle

Groups	Live weight (kg) before iodine treatment (Mean ± SD) 0 day	Live weight (kg) during iodine treatment (Mean± SD)		Average live weight gain (g/day)	Live weight gain percentage	Level of significance
		30 day	60day			
A	84.60 ± 4.70	87.00 ± 4.80	89.00 ± 4.90	73.33	4.94	*
B	89.60 ± 4.80	91.50 ± 5.30	94.60 ± 5.40	83.33	5.28	*
C	90.00 ± 4.10	92.00 ± 4.70	96.00 ± 4.80	100.00	7.09	**
D	85.00 ± 7.30	86.00 ± 7.80	88.00 ± 7.90	50.00	3.40	

Values given above represent the mean ± SD of 5 cattle, ** Significant (p<0.01), * Significant (p<0.05).

Effect iodine and other iodine preparation on body weight in indigenous beef cattle

The live weight of all calves in all treated groups were increased when compared with initial live weight value and also when compared with control group (Table 2). The highest live weight gain was found in Lugol's iodine treated group (7.09%) followed by iodide salt treated group (5.28%) and common salt treated group (4.94%). The lowest live weight gain was determined in control group (No iodine treatment). The reason why might be due to anabolic effect of iodine on weight gain. The similar findings were described by (Golubev and Sedov, 1984; Ovsishcher *et al.*, 1988).

The result reveals that use of iodine formulation may be an effective way of increasing meat production and weight gain in indigenous beef cattle of Bangladesh.

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