



Effect of biostimulation on heamatological and biochemical profiles of post partum anoestrus mithun (*Bos frontalis*) cows

KEYWORDS

Biochemical profiles, Biostimulation, Heamatological profiles, Mithun (*Bos frontalis*)

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ABSTRACT The study was carried out in the herd of mithun maintained at Jharnapani farm, NRC on Mithun, Nagaland. In total, 32 post partum pluriparous anoestrus mithun cows (without any history of calving problems) 5-7 years of age, were divided into two groups as not exposed (NE) (n = 16) and bio stimulated (BS) (n=16) based on the exposure to mithun bull. These mithun were evenly distributed in four strains of mithun namely Arunachalee (8), Mizoram (8), Nagaland (8) and Manipur (8). In each strain, 4 mithun cows were NE and 4 were BS. In BS group, the mithun bull, 5-7years old, intact, healthy was allowed 5 hours per day from 0700 hrs to 1200 hrs daily from day 60 of post partum up to expression of heat signs (average 20.50 day) by observation of twice a day and with bull parading. The blood samples were examined for the biochemical parameters such as alkaline phosphatase (ALK), SGPT (ALT), SGOT (AST), total protein, albumin, globulin, AG ratio and glucose and heamatological profiles were total red blood cells (TRBC), haemoglobin (Hb), erythrocyte sedimentation rate (ESR), packed cell Volume (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC) and total white blood cell (TWBC). It was concluded that high PCV and ALKP were significantly ($p < 0.05$) and other blood parameters were non – significantly higher in BS than NE mithun cows.

INTRODUCTION

Mithun (*Bos frontalis*), a semi-wild rare ruminant species, is believed to have originated more than 8000 years ago and is considered to be a descendants from wild Indian gaur (Simoons 1984 & Mondal and Pal 1999). This animal is found mainly in the North-Eastern Hills region (NEHR) of India and also in some locations of Bhutan, Myanmar, Bangladesh and China. However, due to remoteness of their habitats and other ecological and socio-economic factors, mithun remain one of the least studied ungulates. At present, mithun in the NEHR of India are primarily reared at 1000–3000m above mean sea level under free grazing condition in its natural habitat. The mithun population is decreased gradually due to lack of suitable breeding bulls, increasing of intensive in-breeding practices, declining the land area for grazing and rearing and lack of suitable breeding and feeding management in mithun rearing areas of north eastern region. Long postpartum anoestrus is the major impediment to achieve yearly calving intervals in mithun as in Zebu cows (*Bos indicus*) in tropical countries (Garcia et al. 1988 & Gifford et al. 1989). To our knowledge, there is no information on the effects of biostimulation on heamatological and biochemical profiles in anoestrus and biostimulated mithun cows. The objective of the present experiment therefore, was to determine effect of exposure of suckled anoestrus postpartum mithun cows (*Bos frontalis*) to mithun bulls on the blood heamatological and biochemical profiles of mithun cows. This will enhance the understanding between the blood profiles and biostimulation to enhance the reproductive performance in mithun cows.

MATERIAL AND METHODS

The study was carried out in the herd of mithun maintained at Jharnapani farm, NRC on Mithun, Nagaland. In total, 32 post partum pluriparous anoestrus mithun cows (without any history of calving problems) of 5-7 years of age, were divided into two groups as not exposed (NE) (n = 16) and bio stimulated (BS) (n=16) based on the exposure to mithun bull. These mithun were evenly distributed in four strains of mithun namely Arunachalee (8), Mizoram (8), Nagaland (8) and Manipur (8). In each strain, 4 mithun cows were NE and 4 were BS. The experimental animals were fed daily with *ad libitum* quantity of locally available forages and 5 kg of concentrate fortified with salt and mineral mixture. Fresh tap

water was available throughout the day. All experimental protocols complied with regulations of the Institutional Animal Care and Use Committee (IACUC). Cows in group of not-exposed (NE) were not exposed to any bulls, and were located and handled as to not receive any type of stimuli from the bull and were kept at least 500m away from the bulls. In BS group, the mithun bull, 5-7years old, intact, healthy was allowed 5 hours per day from 0700 hrs to 1200 hrs daily from day 60 of post partum up to expression of heat signs by observation of twice a day and with bull parading. The blood samples were collected from jugular vein into collection tubes containing EDTA at beginning of the experiment both in NE and BS mithun cows and at the end of the experiment i.e. expression of estrus signs (average 20.5 days of experiment in BS cows). The blood samples centrifuged at 3000 x g for 10 min at 4°C. Serum was decanted and stored at -20°C until assayed for biochemical profiles such as ALK, SGPT (ALT), SGOT (AST), total protein, albumin, globulin, AG ratio and glucose and heamatological profiles were TRBC, Hb, ESR, PCV, MCV, MCH, MCHC and TWBC from the fresh blood.

Estimation of hematological profiles were carried out by standard methods described by Coles (1986) and Sastry (1989). The biochemical parameters were carried out using commercial diagnostic chemical kits procured from RFCL Limited, Uttarkahnd, India by using double UV spectrophotometer in animal reproduction laboratory in the institute. Each sample was analyzed twice and the averages of the two readings were taken as the estimated value. Statistical analysis was carried out SPSS 15 software (SPSS, Chicago, IL, USA).

RESULT AND DISCUSSIONS

The heamatological and biochemical parameters of NE and BS mithun cows were revealed that the heamatological parameter such as PCV and biochemical profile such as ALKP was showing significant ($p < 0.05$) different between the NE and BS mithun cows in total (Figure 1 and 2) and individual strain of mithun cows. The increased amount of TRBC in the BS mithun cows is due to hyperactivity and excitement, which may be due to high level of estrogen from graffian follicle (Coles 1986). It is known that the presence of a male and possibly the effect of female pheromones operate by a common mechanism to influence the reproductive system. The TWBC

was higher in NE mithun cows as compared to BS mithun cows because during estrous period excessive migrating of these cells to the uterus for uterine defense mechanism (Sastry 1989). The other blood parameters were non - significantly higher in BS mithun cows than NE mithun cows. The hematological and biochemical parameters were showing non - significant difference between the NE and BS mithun cows in different strains except the PCV and ALKP ($p < 0.05$). There is no information regarding to the blood parameters and hematological profiles in biostimulated mithun cows/bulls. The biochemical parameters such as total protein, albumin, and globulin were showing non- significantly higher in BS than NE mithun cows because estrogen hormone due to biostimulation have to increase the total protein and albumin level. Although the number of animals studied was limited, the biostimulated cows showed a greater the hematological and biochemical value than cows not exposed to mithun bull. The effects of biostimulation on the blood profiles in different strains of mithun were showing that there was non- significant difference between the strains but minor difference was found between the strains.

Based on the results of the present study, it was concluded that high PCV and ALKP were significantly ($p < 0.05$) higher in BS than NE mithun cows and other blood parameters were non – significantly higher in BS than NE mithun cows. Further study is needed with more number of animals in different strains to confirm the effects on blood and hormone profiles with biostimulatory mithun bulls or their excretory products.

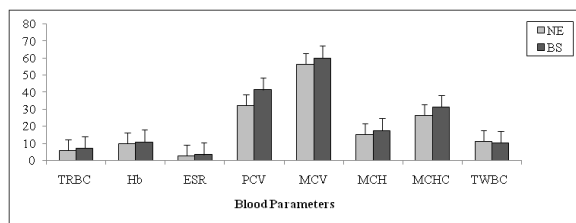


Fig 1: Hematological profiles of NE and BS mithun cows

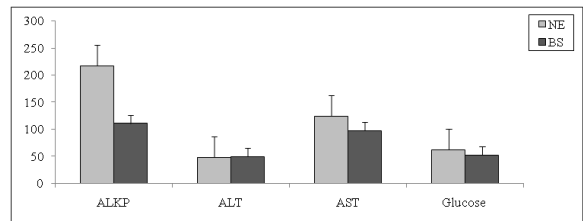


Fig 2: Bio-chemical profiles of NE and BS mithun cows

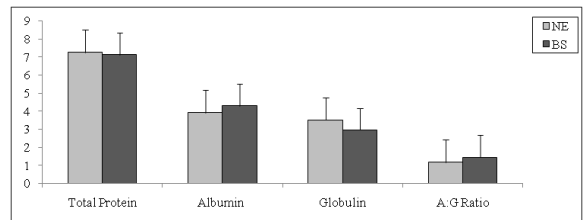


Fig 3: Bio-chemical profiles of NE and BS mithun cows

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