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Relationship between plasma IGF I, body weight and age at puberty in low body weight male Murrah calves and effect of supplementation of fermented yeast culture in the improvement of productive parameters

Anand Laxmi and Sehgal J P
National Dairy Research Institute, India

The onset of puberty has been shown to be a complex interaction between sex steroids and insulin-like growth factor I (IGF-I) in humans, sheep and in cattle. Aim of the present study was to find the relationship between plasma IGF I, Haptoglobin with body weight and age at puberty in male Murrah buffaloes. To evaluate the effect of supplementation of fermented yeast culture (*Saccharomyces cerevisiae*) to low body weight calves, for improvement in body weight of low body weight calves and in advancing the age of puberty through plasma parameters. The proposed research work was carried at National Dairy Research Institute, Karnal Haryana, India. In the present study twelve male Murrah calves with low body weight (110 ± 10 Kg), at ten months of age were selected. The concentration of plasma IGF I and Haptoglobin were estimated. Weekly blood samples were collected and monthly body weights were recorded. The male calves were divided equally in to two groups. The experiment was conducted till they attained fourteen months of age. In one group calves were supplemented with commercial fermented yeast culture (*Saccharomyces cerevisiae*) at 12g/animal/day along with the concentrate. They were provided with wheat straw based diet and concentrate in the ratio 1:1 at 3kg/100kg B W. Similarly fermented yeast culture was supplemented at 24g/animal/day from fourteenth month till they attained puberty. Calves or bulls which did not receive supplementation of yeast culture served as control. The age of the bulls was recorded on attaining puberty. Blood plasma was separated. Plasma IGF I Haptoglobin and Testosterone were measured by enzyme immuno assay (EIA). Dry matter intake and feed conversion efficiency were also estimated, based on feed intake and feed refusal per day.

On supplementation of yeast culture for four successive months the concentration of plasma IGF I, was significantly more ($P < 0.05$) in the supplemented group where as concentration of plasma Haptoglobin was not significantly different between the groups. The average daily gain in the body weight of animals (≥ 700 g/day) was observed in supplemented group whereas in non supplemented group the average daily gain was observed to be at ≤ 500 g/day. The estimated DMI/Head/day or DMI/Head/Day/100kgBW was not significantly different between the groups. The feed conversion efficiency was observed to be significantly greater ($P < 0.05$) for the supplemented group. After fourteen months of age the average daily gain in the body weight of animals was ≥ 400 g/day whereas in the non supplemented group it was ≤ 500 g/day. The plasma IGF I and testosterone concentration was also significantly more in the supplemented group ($P < 0.05$) throughout the course of the study. After fourteen months of age a positive relationship was observed between the two. Highest concentration of testosterone was observed during peripubertal period with in a group and age related increase in IGF I concentration was observed with in a group, but concentration was always greater in the supplemented group. Three out of six bulls attained puberty at the age of 22 ± 2 months and two attained puberty at the age of 24 ± 2 months. In the control group none of the bulls attained puberty till 28 months of age. This is a non invasive biotechnological tool which can be imparted for increasing the productive performance of male Murrah buffaloes.

Biography

Anand Laxmi is working as principal scientist in the field of dairy animal reproduction. She joined National dairy Research Institute since 1993 as scientist and has twenty research publications in national and international journals and has authored several popular articles and technical books in Hindi Language. She is also a member of SAPI and ISSRF scientific bodies. Besides working on ruminant's productivity, by different means, and have also worked on fibroblast cell culture and on transfection and expression of IFN-tau gene under externally funded project by Department of Biotechnology where they had developed an indigenous estrus synchronization technique which was applied at field level in collaboration with Dairy Extension division, NDRI.

dnana44@yahoo.co.in