EFFECT OF UMMB SUPPLEMENTARY FEEDING ON BLOOD BIOCHEMICAL PROFILES IN DAIRY CATTLE

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ABSTRACT

Extent and duration of negative energy balance in recently calved dairy animals is determinant of their postpartum reproductive efficiency. Urea molasses multi-nutrient block (UMMB) supplementation in early postpartum period hastens onset of postpartum ovarian activity. The present study focuses on the certain biochemical changes following UMMB supplementation in recently calved dairy buffaloes. Blood glucose concentrations were significantly higher in the supplemented than the un-supplemented buffaloes. Blood glucose concentrations were significantly higher in the cycling buffaloes than the anestrus buffaloes. A significant positive correlation was found between blood glucose and plasma insulin concentrations. The overall average plasma insulin concentrations were significantly higher and of free fatty acids significantly lower in the supplemented than the un-supplemented controls. Overall biochemical changes revealed negative energy balance to be of lower extent and less duration in UMMB supplemented buffaloes, which might have favored the early onset of ovarian activity in supplemented early postpartum buffaloes.

Key words: Buffalo, Free Fatty Acids, Glucose, Insulin, UMMB

During early postpartum period, supplementary feeding of urea molasses multi-nutrient block (UMMB) has been reported to improve production and reproductive performance of dairy buffaloes, which could be due to improvement of energy status of the animals. Hence the present study was planned with the objective to assess certain biochemical changes following UMMB supplementation.

A total of 21 recently calved Murrah buffaloes belonging to smallholder dairy farmers were selected during the months of February to June. Fourteen buffaloes were supplemented with UMMB without disturbing their basic feeding. These buffaloes had daily UMMB consumption of 700-800 g. Blood samples from each animal were collected starting from the day of calving (0 day) and on 15, 30 and 45 days postpartum. The plasma was separated and stored at -20°C till estimations. For blood glucose the samples were collected in sodium fluoride and estimations were done on the day of collection using auto-analyzer. Blood glucose was estimated by GOD/POD method using auto pack kits (Bayer Diagnostics). The free fatty acids were estimated by methods of Folch *et al.* (1957) and of Lowery and Tinsley (1976). The insulin concentrations were estimated by RIA kits (BARC Trombay).

The overall blood glucose concentrations in UMMB supplemented buffaloes were significantly higher (51.7 ± 1.25 Vs 42.6 ± 1.03 mg/dl) than their un-supplemented counterparts. Buffaloes fed high energy diet had higher blood glucose concentrations (Mokashi *et al.*, 1974). Blood glucose concentrations in supplemented cycling buffaloes were higher (54.09 ±1.01 Vs 43.18 ± 2.04 mg/dl) than in un-supplemented anestrous buffaloes. This indicated that UMMB supplementation contributed to higher blood glucose concentrations and helped in early induction of estrus in the supplemented buffaloes. Blood glucose concentrations were highest on the day of estrus.

The overall average insulin concentrations in UMMB supplemented buffaloes were significantly higher (45.41 ± 0.92 Vs 39.26 ± 0.77 µunits/ml) than control buffaloes thus indicating positive effect of UMMB supplementation on plasma insulin concentrations. It could be due to less negative energy balance in the supplemented buffaloes (Lucy, 1991).

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There was strong positive correlation of blood glucose concentrations with plasma insulin concentrations. The value of the calculated correlation coefficient was lower (r= 0.901) in control group than in supplemented buffaloes(r=0.950). Insulin stimulates anabolism of carbohydrates, fats, proteins and nucleic acids from the building blocks (McDonald, 1980).

Free fatty acid concentrations were highest on the day of calving and gradually decreased thereafter both in the supplemented and the control groups. The overall free fatty acid concentrations in UMMB supplemented were significantly lower (41.60 ± 0.66 Vs 48.68 ± 0.86 mg/dl) than control buffaloes. The UMMB fed buffaloes appear to have reduced mobilization of the adipose tissue resulting into decreased levels of free fatty acids (Fuquay, 1981).

Overall the glucose, insulin and free fatty acid concentrations were indicative of less negative energy balance in the UMMB supplemented buffaloes which could be responsible for early onset of ovarian activity in supplemented buffaloes.

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