

Effect of dietary supplementation of kanamycin on growth efficiency of crossbred female calves

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Efforts are going on to improve the feed conversion efficiency by manipulation of rumen fermentation using various types of feed additives. The effectiveness of antibiotics in achieving increased feed conversion efficiency and improving rate of gain is might be related with lower level of methane production in rumen and alteration in acetate to propionate ratio (Zinn 1982). Antibiotics also maintained health in face of stress and challenges associated with intensive livestock production. Present study was undertaken to determine the influence of kanamycin supplementation on growth rate of crossbreds.

Crossbred female calves (12) of 3 to 7 months of age and 34.0 to 60.0 kg body weight were selected and divided into 2 groups—control group (T₁) and kanamycin group (T₂), which were fed on a same concentrate mixture (mustard cake, 43; rice bran, 27; wheat, 27; mineral mixture, 2 and common salt, 1 parts) as per ICAR (1998) recommendation. The concentrate mixture in group T₂ was supplemented with an antibiotic kanamycin @ 20 ppm/head/day. Green oats served as roughage source. Clean drinking water was offered free choice to the heifers during entire experimental period. The body weight and dry matter intake of each heifer were recorded at fortnightly intervals during 138-day growth trial. A digestion trial of 7 days was conducted at the end of feeding trial and samples of feeds and fodder offered and residue left were collected and analysed for proximate principles (AOAC 1984) and cell wall constituents (Van Soest 1980). The data were analysed using 't' test (Snedecor and Cochran 1968).

The dry matter (DM), crude protein (CP), neutral detergent fibre (NDP), acid detergent fibre (ADF) and total ash content in concentrate mixture was 90.0, 22.5, 32.0, 18.15 and 8.30%, respectively, and corresponding value for green oats were

22.3, 8.7, 65.1, 36.7, and 8.0%, respectively. Kanamycin supplementation effect on digestibility, intake and feed efficiency are presented in Table 1. There were nonsignificant differences in DM, OM and CP intake (g/kg W^{0.75}) between treatments groups. The average body weight gain (g/day) increased nonsignificantly from 350.65±21.72 in T₁ group to 398.55±11.81 in T₂ (kanamycin-supplemented group) which might be due to better nutrient utilization and reduction in loss of energy through methane production as well as non-clinical infection in experimental animals (Mudd and Smith 1982). The feed conversion efficiency was 9.07±0.25 in T₁ group and 8.45±0.69 in T₂ group, thus a nonsignificant improvement was observed due to kanamycin supplementation. The DM digestibility increased significantly from 65.10±1.05% in T₁ to 70.20±0.69% in T₂. The increase in DM digestibility due to kanamycin supplementation might be because of shift or microbial population and an improvement in rumen fermentation efficiency (Kung *et al.* 1992). Kanamycin supplementation improved CP digestibility significantly due to overall improvement in efficiency in nitrogen utilization and this increase was 54.07±0.35% in T₁ to 59.74±0.90% in T₂. The NDF and ADF

Table 1. Kanamycin supplementation effect on digestibility, intake and feed efficiency

Parameters	Control group (T ₁)	Kanamycin group (T ₂)	CD at 5%
Digestibility (%)			
DM digestibility	65.10 ^a ±1.05	70.20 ^b ±0.69	4.30
CP digestibility	54.07 ^a ±0.95	59.74 ^b ±0.90	3.82
NDF digestibility	53.16 ^b ±0.75	50.47 ^a ±1.14	2.40
ADF digestibility	46.77 ^a ±1.10	44.83 ^a ±0.23	3.80
Intake (g/kg W ^{0.75})			
DM intake	99.0±0.72	101.33±1.86	15.56
OM intake	90.93±2.56	93.35±1.70	8.32
CP intake	12.83±0.43	12.84±0.22	1.17
Body weight gain (g/d)	350.65±21.72	398.55±11.81	53.17
Feed efficiency	9.07±0.25	8.45±0.16	0.79

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digestibility decreased significantly from $53.16 \pm 0.75\%$ to $5.47 \pm 1.14\%$ and from $46.77 \pm 1.10\%$ to $44.83 \pm 0.23\%$ in T_1 and T_2 groups respectively. The fibre digestibility in rumen might be inhibited up to some extent by antibiotic supplementation. After supplementation of kanamycin incidences of white scours and other calf hood diseases reduced and weight gain, feed conversion efficiency and nutrient digestibility enhanced in crossbred female calves.

SUMMARY

Crossbred female calves (12) were divided into 2 groups. Both groups were fed on concentrate mixture and green oats, however, ration of group T_2 was supplemented with kanamycin @ 20 ppm/head/day. The average daily body weight gain in groups T_1 and T_2 were 35.65 ± 21.72 and 398.55 ± 11.81 g/day and feed conversion efficiencies were 9.07 ± 0.25 and 8.45 ± 0.16 respectively. The DM and CP digestibility coefficients were higher in group T_2 , whereas NDF and ADF digestibility were lower in group T_2 . Thus, kanamycin as a feed additive, stimulates weight gain and

improves feed conversion efficiency in crossbred female calves.

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