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Oral feeding of vegetable oils for by-passing dietary fats from bio-hydrogenation in growing crossbred heifers

Tandon Mayank, Rao P.V. Raman*, Tiwari D.P.

Department of Animal Nutrition, College of Veterinary and Animal Sciences, G.B.Pant University of Agriculture and Technology, Pantnagar-263 145, India

Reprint reqeust: Dr. P.V. Raman Rao; E-mail: raman_8@rediffmail.com

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Abstract

An experiment was conducted on sixteen crossbred (Jersey x Sahiwal x Holstein Fresien) growing heifers (6–9 months), divided into 4 groups of 4 animals each, in order to probe the feasibility of bypass strategy for the prevention of ruminal bio-hydrogenation of dietary fats by feeding fat capsules prior to usual bran feeding, so as to camouflage the rumen microbes and discern the effect of different vegetable oils on the average serum total fat content, free fatty acids, iodine number as well as growth and nutrient utilization of the heifers. Five ml of vegetable oil was computed to work as 'hydrogen-sink' to absorb ruminal free biohydrogen. Soybean oil (T1), sunflower oil (T2), mustard oil (T3) were blended separately with 25g crushed jaggery as a carrier and fed in encapsulated form to respective treatment groups, whereas control group (T4) received only jaggery bolus without any oil. All the heifers were fed green fodder and concentrate as per their requirements. The feeding trial lasted for 107d. The heifers fed with soybean and sunflower oil capsules, showed higher concentration of serum fatty acids (0.556 and 0.586%, respectively) and iodine number (24.76 and 24.02, respectively) as compared to other groups. The dry matter intake and digestibilities of organic matter and neutral detergent fibre did not differ significantly among the different groups. The digestibilities for crude protein and acid detergent fibre were significantly ($P<0.05$) lower in T1 and T2 than control. It is concluded that vegetable oils with high degree of unsaturation of fatty acids can be fed as 'hydrogen sink' for the prevention of biohydrogenation of dietary fat for improving the product quality in ruminants.

Keywords:

Biohydrogenation, Crossbred heifers, Serum Free fatty acids, Iodine number.