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Cactus Pear (*Opuntia ficus-indica*) as a Complement to Urea-Treated Straw in Dry Season Feeding Systems of Ruminants

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Abstract

Ethiopia's livestock population, the largest in Africa, is contributing little in ensuring food-security, mainly attributed to poor feed quality and unavailability. Due to its adaptability, cactus pear established its own environmental niche on marginal lands in arid areas of Ethiopia and elsewhere. It is widely used as forage, especially during critical periods of feed shortage. Compositionally, cactus pear is rich (dry matter basis) in readily digestible carbohydrate. The other abundant feed resources are cereal residues, which are of low nutritive value. Urea-treatment has been proposed for enhancing their quality. Lack of readily digestible organic matter, which cactus pear has, limits the efficient utilisation of urea-treated straw. Thus, this study aimed at investigating the complementarity of cactus pear and urea-treated straw. A three-months experiment, laid out in a randomised complete block design with eight sheep/treatment, was conducted to assess the effects of cactus pear (C), untreated wheat straw (S), urea-treated straw (UTS)(5 % urea) or wheat bran (WB) on intake, digestibility and growth. Diets consisted of S (T1), S+C (T2), S+C+WB (T3), UTS (T4), UTS+C (T5) and UTS+C+WB (T6). The rate of supplements (C and/or WB) was 40 %. Diets were offered in individual throws twice daily, aiming at 20 % refusals. At the end of the feeding trial, four sheep/group were transferred to metabolic crates for the digestibility trial (7 days). Data were analysed using the SAS software JMP5. Urea-treatment improved crude protein content of straw from 2.7 to 8.7 % and apparent dry matter digestibility (DMD) from 55% (T1) to 65% (T4). Highly significant differences ($p < 0.001$) were observed for total dry matter intake (DMI), DMD and liveweight change. DMI was highest in T5 and T6 (90 and 84 $g/kg\ W^{0.75}$, respectively) and lowest in T1(55 $g/kg\ W^{0.75}$). DMD was highest in T2 and T5 (65 %) and lowest in T1 (55 %). Sheep on T6 had the highest liveweight gain (75.5 g/day) followed by sheep on T3 and T5 (41.5 and 38.0 g/day). In conclusion, cactus pear and urea-treatment significantly increased total feed intake. Cactus pear could substitute wheat bran, provided that straw is urea-treated. Diet T6 appears to be a promising package for dry season feeding systems that could enhance productivity of livestock and thereby improve the livelihood of farmers.

Keywords: Cactus pear, digestibility, Ethiopia, feed intake, liveweight change, straw, urea-treatment, sheep, wheat bran

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