



Effect of Probiotic *Saccharomyces cerevisiae* and *Lactobacillus sporogenes* Supplementation on Growth of Marwari Kids Under Arid Condition

Pankaj Lavania^{1*}, Lokesh Kumar Jain² and Garbar Singh³

¹Department of Livestock Production and Management, College of Agriculture, Jodhpur, Rajasthan, INDIA

²Agricultural Research Station, SKRAU, Bikaner, Rajasthan, INDIA

³Farmer FIRST Project, Directorate of Extension Education, Agriculture University, Jodhpur, Rajasthan, INDIA

*Corresponding author: LK Jain; E-mail: jainlokesh74@gmail.com

Received: 17 Nov., 2024

Revised: 25 Nov., 2024

Accepted: 29 Nov., 2024

ABSTRACT

Goat husbandry plays a vital role in providing house hold nutritional security, increased income and employment in rural transformation. In order to assess the influence of on-farm supplementary feeding of commercial probiotic on growth in growing kids has been evaluated. Twenty (3 months old) weaned kids of Marwari breeds were randomly divided into 2 equal groups. One group served as control (Without supplementation) and other group as treatment group fed probiotic @ 5 g/kid/d for 90 days. Both the group animal grazing on community pasture land. The study revealed that probiotic supplemented experimental group achieved significantly higher ($P<0.05$) body weight gain and improved average daily body weight gain (ADG) by 18.55g more than control group. The study further indicated that Diarrhoea and respiratory disorders occurred less frequently in experimental group compared to control group animals. Conducting farmer's participatory trial on farmer's flock can prove to be a very effective approach for creating awareness and acceptance of technology.

HIGHLIGHTS

- *Saccharomyces cerevisiae* and *Lactobacillus sporogenes* are the potential probiotics.
- Awareness among farmers should be promoted for probiotics in diarrhoea cases of kids.

Keywords: Concentrate feeding, Grazing performance, Growth Performance, Kids, Probiotic

Livestock is an integral component of economic and social fabric of the rural masses in Rajasthan since crop farming is constrained by erratic rains and limited irrigation facilities. In addition to this frequent draught, extreme events triggered by climatic change may pose serious threat to survival of living being in arid region (Patidar *et al.*, 2014). Presently, animal husbandry sector has been identified as an important area for employment generation, while within the animal husbandry the role of goat is very important. It also provides supplementary support system in terms of the income among the weaker communities of the rural societies. Goat farming is one such enterprise which has been practiced by the large human population in India since long (Lavania *et al.*, 2014). In the arid region, goats are reared mainly on community property resources

(CPR) and stubble grazing on cropped land after harvesting of crops. Majority of goat farmers do not supplement concentrate to their animals due to economic status and/or lack of awareness of the benefits of supplementation. Limited concentrate supplementation, in addition to free grazing on range land, is known to improve the growth performance of Sirohi kids (Chaudhary *et al.*, 2000). The use of probiotics prevents pathogenic colonization of the digestive tract, stimulate development of the immune system and its response and counteract negative effect of

How to cite this article: Lavania, P., Jain, L.K. and Singh, G. (2025). Effect of Probiotic *Saccharomyces cerevisiae* and *Lactobacillus sporogenes* Supplementation on Growth of Marwari Kids Under Arid Condition. *J. Anim. Res.*, 15(04): 149-151.

Source of Support: None; **Conflict of Interest:** None



such illness (Rosmini *et al.*, 2004). Probiotics are living microorganisms providing beneficial effects for the host when administrated in adequate amounts (FAO/WHO, 2001). The present study was conducted under the on-farm trial (OFT) to assess growth performance through supplementary feeding of probiotic

MATERIALS AND METHODS

A field trial was conducted on farmer's goat flock maintained on natural range land of Manai village, Tinwari block in Jodhpur district during 2021-2022. Twenty graded Marwari kids, aged three months, weigh 10.07 ± 0.51 kg each were randomly assigned to two groups designated as control (Group-1) and experimental (Group-2) of ten animals each. Kids in both groups were grazed for 8 hours. The vegetative cover of range land was dominated by *Cyodon dactylon*, *Cenchrus biblorus* grasses, *Zizyphus nummularia*, *Calotropis sp.*, *Procera sp.*, shrubs and fodder trees *Acacia nilotica* and *Prosopis cineraria*. The kids of both the groups were offered 250-300g balance concentrate ration. The ration contained DCP 14% and TDN 65%. Concentrate mixture was fortified with mineral mixture @2% and salt 1%. Animals in experimental group were also fed multistrem probiotic preparation @ 5g/kid/d (CFD). Each 250 g probiotic contained *Saccharomyces*

cerevisiae (0.37×10 million colony forming unit) and *lactobacillus sporogenes* (12500 million colony forming unit). Prior to commencement of the experiment all the animals were dewormed on the day one with Albendazole @ 7.5 mg/kg body weight. Cost effectiveness was assessed while considering basic purchase cost of ration items and probiotic vis-a-vis speculated market sale price of live weight gain @ 100/kg by the animals. Statistical analysis of data was carried out using the prescribed procedure.

RESULTS AND DISCUSSION

It could be seen from (Table 1) that average fortnight body weight of experimental group at 105,120,135,150.165 and 180 days of kids age observed as 11.68 ± 0.45 , 12.02 ± 0.56 , 13.65 ± 0.36 , 15.44 ± 0.28 , 16.87 ± 0.62 and 18.10 ± 0.47 kg respectively, where as 11.86 ± 0.62 , 12.72 ± 0.71 , 13.87 ± 0.58 , 14.56 ± 0.82 and 15.67 ± 0.76 kg, respectively for the control group at their respective age of kids under traditional system of management. After 90 days of trial the kids in probiotic supplemented experimental group achieved significantly higher ($P < 0.01$) body weight gain might be due to the optimum pH, stabilization for optimum activity of micro flora, degrading crude fiber and finally better assimilation of digested nutrients and utilization by the experimental group animals. Multi strain probiotic

Table 1: Supplementary feeding impact of probiotic in body weight, disease incidence and B:C ratio in kids

Parameters	Particulars	Body weight of Experimental group (n=10)	Body weight Control group (n=10)
Average fortnight body weight of kids (kg)	Initial body weight at 90 days (kg)	10.07 ± 0.51	10.05 ± 0.51
	105 days	11.68 ± 0.45	10.65 ± 0.39
	120 days	12.02 ± 0.56	11.86 ± 0.62
	135 days	13.65 ± 0.36	12.72 ± 0.71
	150 days	15.44 ± 0.28	13.87 ± 0.58
	165 d group	16.87 ± 0.62	14.56 ± 0.82
	Final body weight at 180 d*	18.10 ± 0.47	15.67 ± 0.76
Average final body weight gain(Kg) *		8.03 ± 0.71	5.78 ± 0.62
Average Daily weight gain (ADG) *		89.88 ± 0.62	71.33 ± 0.71
Cost of concentrate mixture including probiotic supplementation (₹)		2703 = 00	2570 = 00
Income of live weight of kid @ ₹ 100/kg		8030 = 00	5780 = 00
Net Profit (₹)		5327 = 00	3210 = 00
B:C ratio		1.97	1.24

*significantly higher ($P < 0.05$).

when supplemented in diet 5g/d improved overall average daily weight gain (ADG) in experimental group 89.88g than 71.33g in control group animals.

Gastrointestinal and respiratory tract disorders, especially during winter months, have been the main cause of morbidity and mortality in growing kids. Diet supplemented with probiotic successfully combated these disorders, as none of the animals group-2 witnessed any untoward clinical sign. The use of probiotic prevents the imbalance in the intestinal tract and avoids occurrence of diarrhoea. Similar observations were also reported by Singh *et al.* (1998) an improvement in body weight by 570g in 3-4 months old Marwari kids fed 2.5g yeast bolus daily for a period of 3 months than control kids and Deka and Kayastha (2011) also observed higher body weight gain in Jamunapari kids. The trial demonstrated that an extra investment of ₹ 133/- by adding Biobloom helped an additional body weight gain of 2.25 kg/kid. The return from the additional mean live weight gain 2.25 kg in probiotic supplemented kids yielded an additional net income of ₹ 2250/- in 90 days feeding, taking the prevailing market rate of goat meat, as ₹ 100/- live weight.

Analysis of fortnightly data of on-farm trial at Manai village of Jodhpur district of Rajasthan revealed that animals body weight gain in Marwari kids in group-2 fed with probiotic supplemented significantly gained higher live weight (18.10 ± 0.27) than control (15.67 ± 0.76). Further, the diarrhoea and respiratory disorders occurred less frequently in experiment group animals compared to control group.

CONCLUSION

On the basis of results, it can be concluded that on-farm supplementation of multi-strain probiotic preparation @ 5g/kid/d for 90 days enhanced the performance of growing Marwari kids under arid condition. This indicates that supplementation of probiotics may be an economic after weaning for reducing the weaning stress in kids that helps in higher daily weight gain and further it can also be advocated under adverse condition such as drought and famine, which are common phenomenon in arid region of Rajasthan. Conducting farmer's participatory trial on farmer's flock can prove to be a very effective approach for creating awareness and acceptance of technology.

ACKNOWLEDGEMENTS

Authors are thankful to the Dr. Ishwar Singh, DEE & Principal Investigator of ICAR funded Farmer FIRST project, Agriculture University, Jodhpur for providing necessary facilities and logistics support for conducting this study. Authors are also thankful of goat owners for participation in this study.

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