Growth Performance of Calves of Nattukuttai Cattle under Different Feeding Regimes

Sundharesan, S.R., A.Yasotha, M.Murugan and K.Loganathasamy

Department of Livestock Production Management, Madras Veterinary College, TANUVAS, Chennai

Received: September 2025 *13/25* *Accepted:*

ABSTRACT

A study to assess the growth performance of Nattukuttai calves under different feeding regimes in an organized farm for a period of 5 months. 18 calves of age 3 to 4 months, divided into 3 groups (T1, T2 and T3). The T1 calves allowed for grazing only, T2 calves fed with only roughages and T3 calves fed concentrates along with roughages based on total dry matter requirement. Parameters such as fortnightly body weight, body weight gain, average daily gain, dry matter intake, feed conversion ratio, body measurements and body condition score revealed no significant difference among the groups. However numerically higher body weight, BWG, ADG and BCS were observed in T3 group followed by T2 and T1. This study gives the baseline data on the growth parameters of Nattukuttai cattle calves.

Keywords: Nattukuttai calves, feeding, growth performance

INTRODUCTION

Nattukuttai cattle are one of the non-descript cattle of Tamil Nadu and locally known as Kanchikuttai and Chengalpetkuttai. It significantly influences the socioeconomic status of farmers in its breeding tract, which includes Chengalpattu, Kancheepuram, Villupuram and Tiruvallur districts of the North-East agroclimatic zone of Tamil Nadu (Kumar, 2014, Athilakshmy *et al*., 2021a). Nattukuttai cattle are phenotypically short and compact-bodied with brown or grey colour with or without spots. Nattukuttai cattle is still considered as a non-recognized breed, and there is an urgent need to characterize for further improvement. Nattukuttai cattle population has been declining in recent years due to various factors (Athilakshmy *et al*., 2021b). In making decisions about the breed's conservation and future development, the data on the production and reproduction performance of Indigenous cattle would serve as the foundation. Today's calves will be tomorrow's cows and bulls. They are the future replacement stocks. Thus, for productive and healthy adult stock, focus should be on providing proper care and optimum levels of nutrition to calves. The sexual maturity depends mainly on body weight rather than age (Ghose *et al*., 1979). The body weight of the calves is an essential parameter with respect to attainment of sexual maturity, age at first calving and total number of lactations. At present, there is not much study available on these aspects in Nattukuttai cattle calves. Hence, the present work is proposed to study the production performance of Nattukuttai cattle calves in farm conditions.

MATERIAL AND METHODS

The research was carried out at the Cattle and Buffalo Breeding Unit, PGRIAS, Kattupakkam, TANUVAS, over a period of 5 months. Eighteen Nattukuttai calves of either sex, ageing between three and four months, were selected based on body weight and randomly divided into three groups with six calves in each group. The calves in T1 group were maintained under an extensive system (open paddock) with a mud floor and were sent for grazing from 9:00 am to 3:00 pm every day for the entire experimental period. The calves in T2 and T3 groups were

maintained under an intensive system (Tie barn) with a concrete floor and monitor type metal sheet roof. The calves in T2 group were fed with only roughages, whereas the calves in T3 group were fed with roughages and concentrates based on the total dry matter requirement of the calves. The data on growth performance in terms of fortnightly body weight, body weight gain, average daily gain (ADG), dry matter intake (DMI), feed conversion ratio (FCR), body measurements and body condition score (BCS) of treatment were recorded as per the standard procedures and were analyzed statistically by using SPSS version 20 software and ANOVA was used to determine the significance among the treatment groups.

RESULTS AND DISCUSSION

The fortnightly mean ± S.E and analysis of variance of growth parameters in Nattukuttai calves under different feeding regimes are presented in Table I. The results indicated that different feeding regimes did not significantly impact the growth parameters of Nattukuttai calves. These parameters included fortnightly body weight, body weight gain, ADG, DMI, FCR, body measurements viz., body length, chest girth and height at withers and BCS.

Statistical analysis revealed that there was no significant difference in body weight among treatment groups during all the fortnights (P>0.05). Among the treatment groups, the highest overall body weight gain was observed in the T3 group, followed by the T2 and T1 groups. These results are in accordance with Vanan. (1991) who reported that Murrah buffalo calves in stall housing and concentrate feeding had higher growth rate than others.

The body weight range of the present study are in accordance with Iype and Venkatachalapathy (2001) and Iype *et al.* (2016) who also reported that the body weight of Vechur calves and Kasaragod calves were 60 and 58 kg, respectively. The body weight gain and ADG showed no significant difference among treatment groups (P>0.05). Among the treatment groups, the overall body weight gain and ADG of the T3 group were numerically higher than those of the T2 and T1 groups. In line with Suarez *et al.* (2007), Rashid *et al.* (2015) and Kim *et al.* (2022), who reported that diets with varying concentrate to roughage ratios had no influence (P > 0.05) on ADG and body weight gain, but numerically higher weight gain on high concentrate supplementation group.

Compared with high-concentrate feeding of 3 kg/calf for 21 weeks, fast-growing Sahiwal calves showed a daily gain of 0.470 g (Manoj *et al.,*2014). It may be due to the higher birth weight and genetic makeup of Sahiwal cattle. The DMI and FCR showed no significant difference between treatment groups (T2 and T3), whereas DMI and FCR were not recorded in the T1 group. However, the mean DMI of the T3 group was numerically higher than that of the T2 group, and the overall mean FCR of the T3 group were numerically lower than that of the T2 group, indicating the T3 group had better feed conversion efficiency. Rashid *et al.* (2015) reported that diets with a higher concentrate to roughage ratio (75:25) had higher DMI and FCR compared to lower concentrate to roughage ratios (65:35 and 55:45).

Statistical analysis revealed that there was no significant difference in body measurements among treatment groups during all the fortnights (P>0.05) except height at withers, which differed significantly (P<0.05). Mean chest girth and height at withers of Nattukuttai calves (9-10 months of age) at the end of the study are in accordance with the range reported by Kumar. (2014), however, the mean body length was slightly higher in the present study.

The findings of the present study are in contrast to those of Singh *et al*. (2015), who observed a significant difference in body measurements in

crossbred heifers fed with four different dietary treatments. The BCS also showed a significant difference among treatment groups (P>0.05). The results of the present study are in contrast with Cuffia *et al.* (2020) and Yadav *et al.* (2022), who reported that no significant differences were observed in BCS between the control and treatment groups.

SUMMARY

The study found that different feeding regimes to treatment groups, viz., T1 (grazing only), T2 (fed with only roughages) and T3 (fed with roughages and concentrates) had no impact on growth parameters of Nattukuttai cattle calves, such as body weight, body weight gain, ADG, DMI, FCR, body measurements and BCS. However, this study gives the baseline data on the growth parameters of Nattukuttai cattle calves.

Table I: The fortnightly mean ± S.E and analysis of variance of growth parameters in Nattukuttai calves under different feeding regimes

Parameters	Treatments			F-value
	T1	T2	T3	
Overall weight gain (kg)	21.73±0.34	22.18±0.51	23.33±0.89	1.746^{NS}
Body weight gain (kg)	2.17±0.03	2.22±0.05	2.33±0.09	1.719^{NS}
Average daily gain (kg)	0.145±0.002	0.148±0.003	0.156±0.006	1.746^{NS}
Dry matter intake (kg/day)	-	1.32±0.08	1.38±0.09	1.290^{NS}
Feed conversion ratio	-	9.01±0.16	8.85±0.09	0.021^{NS}
Final body length (cm)	84.00±1.69	81.75±1.64	83.92±1.73	0.572^{NS}
Final chest girth (cm)	91.50±1.33	89.62±0.99	93.00±1.69	1.486^{NS}
Final height at withers (cm)	87.83^{ab}±1.62	82.67^{a}±1.28	88.50^{b}±1.65	4.376^{*}
Body condition score	2.52±0.02	2.60±0.03	2.67±0.08	0.039^{*}

Means bearing different superscripts (small letter) in a row differ significantly between groups.

^{NS} – Not significant * - significant (P<0.05

REFERENCES

Athilakshmy, P., P.Kumaravel and N.V.Rajkumar (2021a), Socioeconomic and Nutritional Contribution of Nattukuttai Cattle in Tamil Nadu, *Indian J. Anim. Sci.,* **50**(5): 2347-2774.

Athilakshmy, P., P.Kumaravel and T.T.Vanan (2021b), Scientific selection and breeding is required to conserve the genetic pool of Nattukuttai cattle in Tamil Nadu, *J. Krishi Vigyan.*, **10**(1): 251-257.

Cuffia, M., J.Baudracco, L.Romero, A.Cuatrin, G.Gagliostro, J.Maiztegui and E.Comerón (2020), A simplified feeding system did not affect milk production compared with a total mixed ration system in dairy cows, *Ital. J. Anim. Sci.*, **19**(1): 887-895.

Ghose, S.S., M.Haque, G.Rahman and M.Saddulah (1979), A comparative study of age at first calving, gestation period and calving interval of different breeds of cattle, *Bangladesh Vet. J*., **11**: 9-11.

Iype, S. and R.T.Venkatachalapathy (2001), Vechur cattle of Kerala, Monograph published by Kerala Agricultural University, pp. 9 - 13.

Iype, S., T.Venkatachalapathy, P.K.Santosh and A.Behera (2016), Characterization of Kasargod cattle of Kerala, *IOSR-JAVS.*, **9**(11): 26-32.

Kim, W.S., J.Ghssemi Nejad, D.Q.Peng, Y.H.Jo, J.Kim and H.G.Lee (2022), Effects of different protein levels on growth performance and stress parameters in beef calves under heat stress, *Sci Rep.,* **12**: 8113.

Kumar, V.D. (2014), Evaluation of performance characteristics of a distinct cattle population (*Nattukuttai Madu*) in the north–eastern agro climatic zone of Tamil Nadu, Unpublished MVSc Thesis submitted to Tamil Nadu Veterinary and Animal Sciences University, Chennai- 51.

Manoj, M., R.S.Gandhi, T.V.Raja, A.Verma, A.Singh, G.K.Sachdeva and A.Kumar (2014), Genetic parameters of body weights at different ages in Sahiwal heifers, *Indian J. Anim. Res.*, **48**(3): 217-220.

Rashid, M.M., K.S.Huque, M.A.Hoque, N.R.Sarker and A.K.F.H.Bhuiyan (2015), Effect of concentrate to roughage ratio on cost-effective growth performance of Brahman crossbred calves, *J. Agri. Sci. Tech.*, **5**(4): 286-95.

Singh, V.P., M.Dubey and R.K.Pandey (2015), Effect of different feed combinations on the growth performance of crossbred heifer calves, *Asian J. Anim. Sci*., **9**(5): 225 – 232.

Suarez, B.J., C.G.VanReenen, N.Stockhofe, J.Dijkstra and W.J.J.Gerrits (2007), Effect of roughage source and roughage to concentrate ratio on animal performance and rumen development in veal calves, *J. Dairy Sci.*, **90**(5): 2390-2403.

Vanan, T.T. (1991), Growth of buffalo calves under different management systems, Unpublished MVSc Thesis submitted to Tamil Nadu Veterinary and Animal Sciences University, Chennai- 51.

Yadav, S.K. (2022), Performance of dairy calves fed with total mixed ration, Unpublished MVSc Thesis submitted to Tamil Nadu Veterinary and Animal Sciences University, Chennai- 51.