



Research Article

PERFORMANCE OF ASSAM HILL GOAT AND THEIR CROSSBRED BEETAL THROUGH ARTIFICIAL INSEMINATION IN HILL DISTRICT OF ASSAM

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Received: May 19, 2018; Revised: May 27, 2018; Accepted: May 28, 2018; Published: May 30, 2018

Abstract: The study was conducted in the hill district of Karbi Anglong in Assam to evaluate the growth and reproductive performances of Assam Hill (AH) goat and their crossbred (CB; Beetal x Assam Hill goat). The cross breeding was done through Artificial Insemination (AI) with frozen semen with conception rate of 88 per cent. The mean growth performances of CB goats in terms of body weight at birth, 3, 6, 9 and 12 months age were 2.12±0.07, 6.36±0.03, 14.28±0.25, 18.32±0.10 and 22.07±0.13 Kg respectively which was found highly significantly ($p < 0.01$) heavier than that of AH goat. The mean reproductive performance of CB goat viz., age at kidding, kidding interval and gestation period were 428.88±4.47, 224.64±2.08 and 149.88 days respectively which were highly significantly ($p < 0.01$) superior to AH goat in reproductive performances except age at sexual maturity. The results revealed that the CB (Beetal x AH) goat performed better in comparison to AH goat and hence, AI can be adopted for crossbreeding at farmers for better income generation.

Keywords: Assam Hill goat, Beetal, Crossbred, Artificial Insemination, semen, Doe, Buck

Citation: Doley M.K., *et al.*, (2018) Performance of Assam Hill goat and their crossbred Beetal through Artificial Insemination in hill district of Assam. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 10, pp.- 6168-6169.

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Academic Editor / Reviewer: Dr Sourabh Deori

Introduction

The goat, "a poor man's cow" also known as "Movable Wealth" has tremendous scope for the nomads, landless, marginal and small farmers to be projected as 'Animal of Future' for rural livelihoods. Goats are capable of adapting to diverse agro-climatic conditions as well as it can convert poor quality feed into a valuable human food. Assam has a total goat population of 61 69,193 of which Karbi Anglong district has a contribution of 4.56 percent [1]. The growth and reproductive performance of goats were decreasing day by day due to inbreeding amongst the AH goat. AH goat is small in size with high meat quality whereas Beetal is a dual purpose heavy breed with regular twinning ability (52.6%) and attain body weight of 21.83Kg at 12months of age [2]. Keeping in view the advantages of high body weight gain capacity of Beetal goats, upgradation of small size AH goat and thereby helping the farmers for their economic upliftment in shorter duration of time was felt. Therefore, the present study was aimed at to evaluate the growth and reproductive performances of F₁ generation of AH goat and their CB goat along with AI to popularize it as an alternative handy tool for genetic improvement at farmers' field.

Materials and methods

The study was conducted by Krishi Vigyan Kendra, Karbi Anglong, Assam Agricultural University at farmers' field with does selected at random with active participation of the Department of Animal Husbandry and Veterinary, Karbi Anglong Autonomous Council, Diphu. The AI was done with frozen semen after 16-18 hours onset of oestrus in 25 does (age 18-24 months) which showed the oestral symptoms viz., restlessness, vaginal discharge, bleating, frequent urination etc., whereas natural breeding system was allowed for breeding of

Assam Hill goat with local buck. The growth (birth weight, body weight at 3, 6, 9 and 12 months) and reproductive (age at maturity, age at kidding, kidding interval and gestation period) performances data of F₁ generation were recorded separately through routine field visits. The data generated from the study were analyzed as per standard methods [3].

Table-1 Mean growth performance of AH goat and CB goat (mean ± SE)

Body weight (Kg)	Assam Hill goat	CB goat	t value
At birth	1.46 ± 0.05 (25)	2.12 ± 0.07 (22)	6.7328**
3months	4.68 ± 0.12 (21)	6.36 ± 0.03 (20)	12.5509**
6months	8.75 ± 0.15 (19)	14.28 ± 0.25 (18)	19.0096**
9months	11.97 ± 0.32 (19)	18.32 ± 0.10 (18)	18.1458**
12months	15.32 ± 0.11 (18)	22.07 ± 0.13 (18)	38.5157**

Within parenthesis are the no. of observation

NS: Non-significant ($P > 0.05$), *: Significant ($P < 0.05$), **: Highly Significant ($P < 0.01$)

Table-2 Reproductive performances (Mean ± SE) of AH goat and CB goat

Reproductive traits	Assam Hill goat	CB goat	t value
Age at maturity (days)	298.17 ± 3.87 (19)	287.35 ± 4.01 (18)	1.9393 ^{NS}
Age at Kidding (days)	448.00 ± 2.46 (19)	428.88 ± 4.47 (18)	3.7451**
Kidding interval (days)	241.52 ± 3.09 (18)	224.64 ± 2.08 (18)	4.5226**
Gestation period (days)	147.47 ± 0.71 (18)	149.88 ± 0.49 (18)	2.7713**

Within parenthesis are the no. of observation

NS: Non-significant ($P > 0.05$), *: Significant ($P < 0.05$), **: Highly Significant ($P < 0.01$)

Results and Discussion

Growth performances

The results pertaining to mean growth performance of AH goat and CB goat (mean $\pm$ SE) are presented in the [Table-1]. The mean growth performances of AH goats and CB goats in terms of body weight at birth, 3, 6, 9 and 12 months age were 1.46 ± 0.05 , 4.68 ± 0.12 , 8.75 ± 0.15 , 11.97 ± 0.32 and 15.32 ± 0.11 kg respectively for AH goats and 2.12 ± 0.07 , 6.36 ± 0.03 , 14.28 ± 0.25 , 18.32 ± 0.10 and 22.07 ± 0.13 kg respectively for CB goats. The CB goats were found to be highly significantly ($p < 0.01$) heavier than that of AH goat at all ages indicating the superiority of Beetal crossbred to AH goat. Ravimurugan, *et al.* (2009) [4] observed birth weight of 1.80 ± 0.02 kg in indigenous male goat in Tirunelveli district of Tamil Nadu which is comparable with the present study. Malau-Adauli, *et al.* (2004) [5] observed birth weight of kids ranged from 1.3 to 1.4 kg in Red Sokoto which was less than birth weight of Beetal kids. These results are in agreement with the findings of Das, *et al.* (2013) [6] for increasing body weight gain of Beetal crossbred goats compared to Assam local goat. Similarly, these results are also in close agreement with the findings of Kharkar, *et al.* (2014) [7], Mallick, *et al.* (2017) [8].

Reproductive performances

The mean along with standard errors for reproductive performances of AH and CB goats are presented in [Table-2]. The result reflects that the mean age at maturity, age at kidding and kidding interval is comparatively lower in case of CB goat under study. This indicates superiority of crossbred in terms of reproductive traits over AH goat. The mean age at maturity, age at kidding, kidding interval and gestation period for AH goat was recorded 298.17 ± 3.87 , 448.00 ± 2.46 , 241.52 ± 3.09 and 147.47 ± 0.71 days respectively whereas estimation of same parameters for CB goats was recorded as 287.35 ± 4.01 , 428.88 ± 4.47 , 224.64 ± 2.08 and 149.88 ± 0.49 days respectively. The reproductive traits under study were highly significantly ($P < 0.01$) lower in CB goats compared to AH goats except for age at sexual maturity. However, contrary to our findings, Mallick *et al.* in 2017 [8] found higher estimates for mean age at maturity, age at first kidding and kidding interval (days) in local goat as well as their crossbred goat in Cuttack district of Odisha. Mukundan, (1979) [9] reported higher age at first kidding in Malabari goat varying from 455 to 612 days. The higher estimates of kidding interval were reported by Mukundan, (1979) [9] in Malabari goat ranges from 307 to 332 days and Mishra in 1985 [10] in Beetal goat (304 ± 4.1 days) compared to our present findings. The mean gestation period for AH and CB goat in the present study is in corroboration with the findings of Mishra, *et al.* (1979) [11], Kumar, *et al.* (2004) [12] and Patel, *et al.* (2013) [13]. The variations observed may be attributed to differences in the feeding and management practices of farmers, genotype and environmental factors of the experiments.

Conclusion

From the above findings it can be concluded that CB (Beetal x AH) goats performed better in comparison to AH goats in the hill district of Assam and AI can be suitably used for the crossbreeding. Adoption of Artificial Insemination with Beetal germplasm can play an important role in genetic improvement of Assam Hill goat and thereby increasing farmers' income in agro-climatic conditions similar to hill district of Karbi Anglong.

Application of research: The trial results help the farming community to understand the importance of artificial techniques for goat improvements. The data generated from the study also helps the policy maker and researchers for further goat improvements strategies in agro-climatic condition similar to hills district in Assam.

Research Category: Animal science

Acknowledgement / Funding: Author thankful to from The Director of Extension Education, Assam Agricultural University, Jorhat, 785013, Assam, India.

***Research Guide or Chairperson of research:** Dr Monuj Kumar Doley

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Research project name or number: Nil

Author Contributions: All author equally contributed

Author statement: All authors read, reviewed, agree and approved the final manuscript

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

References

- [1] 19th Livestock census (2012) *Department of Animal Husbandry, Dairying and Fisheries. Ministry of Agriculture, Govt. of India, New Delhi.*
- [2] Thiruvankadan A.K. (2014) *Country Report: India, In: Asian-Australasian Dairy Goat Network Country Report 2013/14. Institute of Tropical Agriculture, University Putra Malaysia UPM Serdang, Malaysia, 19-32.*
- [3] Snedecor G.W. and Cochran W. G. (1994) *Statistical Methods 8th Edn., Iowa State University Press, Iowa.*
- [4] Ravimurugan T., Devendran P., Cauveri D. and Balachandran, S. (2009) *Tamilnadu J. Veterinary & Animal Sciences*, 5 (5), 203-207.
- [5] Malau-Aduli B. S., Eduvie L., Lakpini C. and Malau-Aduli A.E. (2004) *Reprod. Nutr. Dev.*, 44(2), 111-21.
- [6] Das B., Das D., Aziz A., Kalita D. and Roy T. C. (2013) *Tamilnadu J. Veterinary & Animal Sciences*, 9 (4), 292-295.
- [7] Kharkar K., Kuralkar S.V. and Kuralkar, P. (2014) *Indian J. Small Rumin*, 20, 12-15.
- [8] Mallick P.K., Prasad S.M., Pourouchottamane R. and Mohanta R. K., (2017) *Indian Vet. J.*, 94 (03), 71-73.
- [9] Mukundan G. (1979) *Genetic studies of some economically important production characteristics in Malabari breed of goat and its exotic crosses. Ph. D. Thesis, Ruhelkhand University, Bareilly (U. P.).*
- [10] Mishra A.K. (1985) *Proceeding VIII Workshop on Goats held at CIRG, Farah, 13-15 March*, 48.
- [11] Mishra R.K., Nivsarkar A.E. and Arora C. L. (1979) *Indian J. Anim. Sci.*, 49 (11), 967-68.
- [12] Kumar A., Tomar A.K. S. and Mehta B.S. (2004) *Indian J. Dairy Sci.*, 57 (4), 255-57.
- [13] Patel A. C. and Pandey D.P. (2013) *J. Livestock Sci.*, 4, 17-21.