

Performance of Crossbred and Local Pig in Namsai District of Arunachal Pradesh

Santosh Kumar^{1*}, B. K. D. Borah², D. Sasmal³, M. Kanwat⁴ and H. Kalita⁵

¹Krishi Vigyan Kendra Namsai (ICAR AP Centre, Basar), Arunachal Pradesh, INDIA

²Subject Matter Specialist, Animal Science, Krishi Vigyan Kendra Namsai ICAR AP Centre, Basar, Arunachal Pradesh, INDIA

³Subject Matter Specialist, Fishery Science, Krishi Vigyan Kendra Namsai ICAR AP Centre, Basar, Arunachal Pradesh, INDIA

⁴Sr. Scientist and Head Krishi Vigyan Kendra Namsai ICAR AP Centre, Basar, Arunachal Pradesh, INDIA

⁵Principal Scientist Entomology Joint Director, ICAR Research Complex for NEH Region, Arunachal Pradesh Centre, Basar, Arunachal Pradesh, INDIA

*Corresponding Author: sashima1980@gmail.com

How to cite this paper: Kumar, S., Borah, B., Sasmal, D., Kanwat, M., & Kalita, H. (2020). Performance of Crossbred and Local Pig in Namsai District of Arunachal Pradesh. *International Journal of Livestock Research*, 10(12), 184-188. doi: <http://dx.doi.org/10.5455/ijlr.20200804104712>

Received : Jul 27, 2020

Accepted : Nov 24, 2020

Published : Dec 31, 2020

Copyright © Kumar *et al.*, 2020

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). <http://creativecommons.org/licenses/by/4.0/>

Abstract

The objective of this study was to evaluate the performance of crossbred (Hampshire 75% and Assam local 25%) and Local piglets under present climatic condition and farming practices of Namsai district. Average body wt. of male crossbred and local piglet reported higher ($P<0.05$) at 240- & 360-days age was 86.41 ± 6.93 vs. 54.20 ± 3.93 and 109.5 ± 6.44 vs. 60 ± 4.35 kg respectively similarly, female crossbred piglets were also gain significantly higher ($P<0.05$) body weight than the local piglets (49.50 ± 1.17 vs. 37.91 ± 1.99 kg) up to 240 days before pregnancy. The average age at maturity of gilts was 259 ± 23 vs. 320 ± 45 days, age at first farrowing 373 ± 35 vs. 436 ± 36.44 , litter size (No.) at first farrowing (6.4 vs. 4.0) and net return from crossbred piglets was higher by 64.24% in comparison to Local piglets. Thus, it is concluded that the crossbred piglets can sustain in the prevailing climatic condition of Namsai district of Arunachal Pradesh.

Keywords: Crossbred Pig, Performance, Namsai District



Introduction

North-Eastern region of the India characterized by fragility, marginality, inaccessibility, ethnic heterogeneity and ecosystem diversity (Naskar and Das, 2007) and comprises of a high proportion of tribal people and pig rearing is an integral part of their way of life since time immemorial (Payeng *et al.*, 2013). Meat is a largest contributor in the livestock output (Anonymous-2018). The pig is second most important meat producing animal of Arunachal Pradesh (Anonymous-2019) quite popular amongst the tribal people as a source of livelihood security, improving the socio-economic status of the tribal population & weaker section of the society and provide nutritious food and animal protein however, numbers are declining over the period (Naskar and Das, 2007). Pig farming is traditionally belongs to the underprivileged group of people who cannot afford to investment on quality piglets, scientific feeding, housing and health management. That reduces the overall performance of this sector resulted small body size, higher age at maturity, high mortality in piglets, high incidences of disease and parasites and ultimately poor return from local pig (Kumaresan *et al.*, 2009). The average meat yield of pig in India is 35 kg per animal which is about 55% less than the world average of 78.20 kg per animal (Pork-2016). Pig reared by the farmers are nondescript and possess small body size, poor weight gain ability, smaller litter size and late sexual maturity due to poor genetic potential, traditional feeding, housing and health management leading to poor economic return (Kumaresan *et al.*, 2007, 2009). There are several constraints for pig farming in North Eastern region and Arunachal Pradesh among them availability of quality piglets is one and most to be address on priority. Quality crossbred pig is developed by crossing of local pig with different exotic pig breeds that are able to grow faster, gain higher body weight, mature early, produce large litter size at lesser farrowing interval, grow faster, has better feed efficiency, less disease incidence and good survivability in local condition (Kumaresan *et al.*, 2009). Therefore, points keeping in mind, the present study was conducted as frontline demonstration with objectives of evaluation of performance of crossbred piglets under prevailing practice of pig farming of Namsai district of Arunachal Pradesh.

Materials and Methods

Namsai District is situated at north easternmost part of the country and lies between 95.45 to 96.20 E longitudes/ 27.30 to 27.55 N latitudes with a geographical area of about 1587 sqkm. Namsai district is adjoining to Assam and non-descript pig are mostly resemble to Assam local pig. Therefore, in the present study, crossbred piglets (Hampshire 75% x Assam local 25%) developed by College of Veterinary Science (Assam Agricultural University), Guwahati, India were introduced during the year 2014-15 to evaluate the performance under the prevailing management and climatic condition.

Crossbred piglets were reared on existing piggery farmers' field (n=6) situated at Chongkham, Gunanagar, Momong, Solungtoo, Namsai, and Mahadevpur village of Namsai District, results were compared with Local Piglets traditionally reared by the farmers. Age and weight of crossbred piglets and Local piglets were varied from 45 to 60 days and between 8 to 10 kg at the time of start of experiment. Total 30 Piglets from both the groups 15 in each were fed locally available feed materials including crushed maize, rice bran/polish, kitchen and hotel waste and Colocasia leaves, papaya fruits, banana stem, rice bran and polish, kitchen waste etc. twice a day. All piglets were housed made with locally available material; however, floor was made by cement and concrete. Prior to start the experiment, farmers were imparted training on scientific management of pig and advised to feed equal amount of feed to all the piglets. During initial stage, piglets were fed concentrate feed and gradually switched over to local feed 3 to 4 kg/day/head made with 50% cereal grains (Maize) & by product (Rice bran/Polish) and 50% nonconventional feeds. Family labour, depreciation of housing/animals, feed and medicine cost was included to calculate cost of rearing of pig. All the piglets were vaccinated with most prevalent disease FMD and swine fever. Performance of crossbred piglets was evaluated on the basis of body weight gain, age at sexual maturity, age at first farrowing and litter size of first farrowing. Body weight gain was directly measured morning at the commencement of the experiment and thereafter at 60 days interval using digital electronic balance. After the confirm pregnancy, weight of female piglet was not taken in the record. Sexual maturity was calculated based on age at first heat detected by prominent visual sign vocalization and mounting pen mates followed by backpressure test. Matting of sows was done at commencement second heat with crossbred boar and local boar in the respective groups. Average litter size was calculated by total number of litter born divided by total number of sow farrowing (Panda C, 2018). Average, standard error and percent of differences were calculated. Test of significance was calculated using T-test (Snedecor and Cochran, 1989).

Results and Discussion

Body weight gain in crossbred male as well as female piglets was reported higher than the local pigs. Average body weight of male piglets at 240 and 360 days was 86.41 ± 6.93 kg vs. 109.5 kg and 54.20 ± 3.93 kg vs. 60.08 ± 4.35 kg for crossbred and Local pigs respectively (Table 1).

Table 1: Body weight gain in Crossbred and Local piglets (kg)

Male			Female		
Age (day)	Crossbred piglets (n=5)	Local piglets (n=5)	Age (day)	Crossbred piglets (n=10)	Local piglets (n=10)
60	10.78 ± 0.42	8.76 ± 0.38	60	7.79 ± 0.24	7.32 ± 0.33
120	24.33 ± 0.74	16.38 ± 0.95	120	17.53 ± 0.48	12.78 ± 0.82
180	48.93 ± 1.39	33.91 ± 1.80	180	36.08 ± 0.91	27.10 ± 1.54
240	86.41 ± 6.93	54.20 ± 3.93	240	49.50 ± 1.17	37.91 ± 1.99
360	109.51 ± 6.44	60.08 ± 4.35	-	-	-
Mean	$55.99^{a*} \pm 7.77$	$34.67^{b*} \pm 4.27$	Mean	$27.72^{a*} \pm 2.60$	$21.28^{b*} \pm 1.98$

*Different superscript within the row indicate significant difference ($P < 0.05$) for male and female piglets

The total body weight of crossbred male at the marketable age of 240 & 360 days was higher by 60 & 182.5 percent than the Local male pigs. Similar trend was also reported in female crossbred piglet's body weight was higher by 30.57% (49.50 vs. 37.91 kg) at the age of 240 days. The overall mean body weight of male (360 days) and female (240 days) was significantly ($P < 0.05$) higher than the Local piglets. The overall average daily weight gain was also recorded significantly higher ($P < 0.05$) in crossbred than the Local male (0.19 vs 0.05 kg) as well female (0.22 vs 0.18 kg) piglets (Table 2).

Table 2: Average daily weight gain in Crossbred and Local piglets (kg)

Male			Female		
Age (day)	Crossbred piglets (n=5)	Local piglets (n=5)	Age (day)	Crossbred piglets (n=10)	Local piglets (n=10)
60-120	0.23 ± 0.01	0.13 ± 0.02	60-120	0.16 ± 0.00	0.09 ± 0.01
120-180	0.41 ± 0.01	0.29 ± 0.01	120-180	0.31 ± 0.01	0.24 ± 0.01
180-240	0.62 ± 0.11	0.34 ± 0.08	180-240	0.22 ± 0.00	0.18 ± 0.01
240-360	0.19 ± 0.02	0.05 ± 0.02	-	-	-
Mean	$0.36^{a*} \pm 0.05$	$0.20^{b*} \pm 0.03$	Mean	$0.23^{a*} \pm 0.01$	$0.17^{b*} \pm 0.01$

*Different superscript within the row indicate significant difference ($P < 0.05$) for male and female piglets

Although, economic efficiency of pig production depends on reproductive performances affected by numerous environmental and genetic factors (Amaral *et al.*, 2010; Rekiel *et al.*, 2011; Szyndler-Nędza *et al.*, 2013; Cools *et al.*, 2014). Results on higher body gain in crossbred pig was in accordance with Kumaresan *et al.* (2009) who reported higher body weight in crossbred pig in comparison local pig of Mizoram. The average age at maturity of gilts was 259 ± 23.35 vs. 320 ± 45.12 days, age at first farrowing 373 ± 35.45 vs. 436 ± 36.44 days, litter size (No.) at first farrowing (6.4 vs. 4.0) and litter weight at birth (5.10 vs 2.73 kg) were found higher over Local piglets. Age at sexual maturity and litter size at first farrowing were found to be improved by 19.06 and 60 percent respectively over Local pig. Reproductive performance reported in the present study were in accordance to the previous results reported in north east region (Kumaresan *et al.*, 2009, Borpuzari *et al.*, 2013, Hazarika *et al.*, 2015 and Lalremruata *et al.*, 2015). Karolina *et al.* (2105) reported significant correlation between body weight and age on reproductive performance of piglets, therefore, it is evident from the present study that crossbred piglets gain higher body weight at shorter interval resulted early sexual maturity and age at first farrowing in comparison to local piglets.

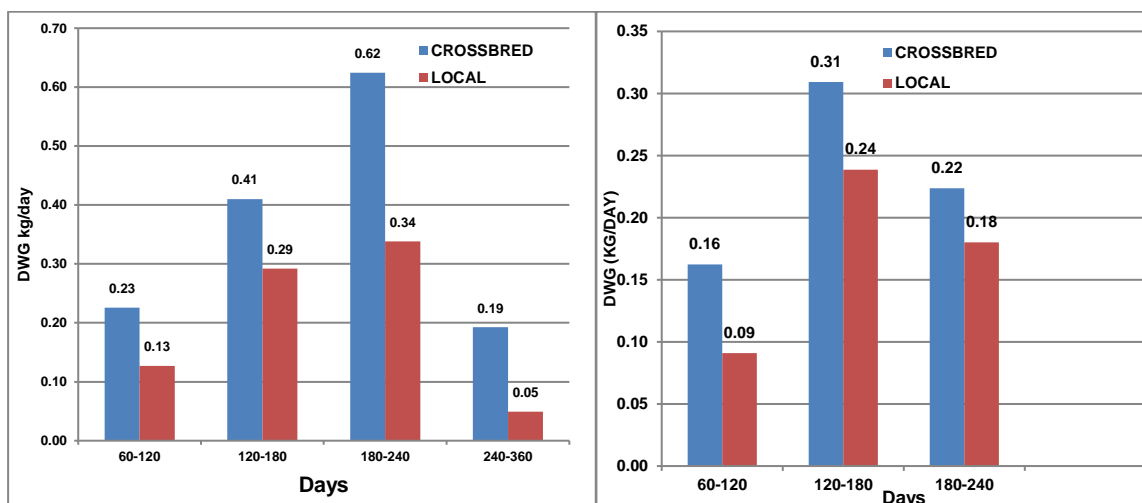


Figure 1: Average daily weight gain in Male piglets

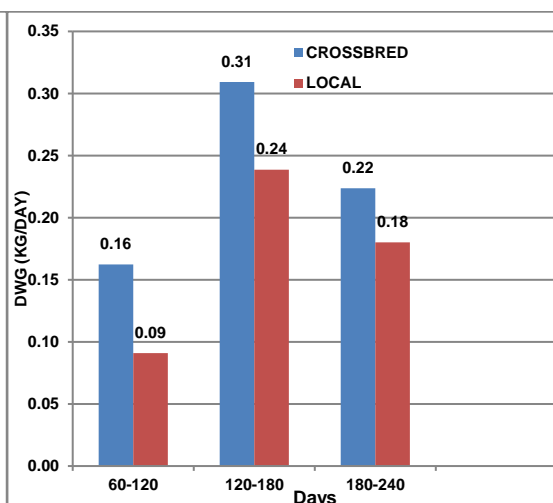


Figure 2: Average daily weight gain in Female piglets

Table 3: Reproductive performance of Crossbred and Local piglets (kg)

Particulars	Crossbred pig	Local pig
Age at Sexual maturity (day)	259 ^a ±23.35	320 ^a ±45.12
Age at first farrowing (day)	373 ^a ±35.45	436 ^a ±36.44
Litter size at first farrowing (No.)	6.4 ^a ±0.49	4.0 ^a ±0.25
Litter weight at first farrowing (Kg)	5.10 ^a ±0.31	2.73 ^a ±0.20

Under the similar feeding system the crossbred piglet attain higher body at shorter duration with early maturity. Therefore, fetch higher net income (Rs. 9660 vs 5880) over the local piglets. Kumaresan *et al.* (2009) also reported higher return from crossbred piglets.

Conclusion

Based on results observed in the presents study, it can be concluded that crossbred pigs (Hampshire 75% x Assam local 25%) gain significantly higher body weight in both the male and female sex with the highest daily gain of body weight up to the age of 240 days. Reproductive performance of crossbred female piglets in terms of sexual maturity, age at first farrowing, litter size of first farrowing and net return was better over Local pigs in existing pig farming system of the district. Therefore, rearing of crossbred pig may be popularized in the areas of Namsai district to ensure better nutrition and livelihood of tribal farming community.

Acknowledgement

Authors are highly thankful to the Director ICAR-NRC on Yak, for providing the necessary fund and guidance for the experiment under frontline demonstration.

Conflict of Interests

There is no conflict of interest.

Publisher Disclaimer

IJLR remains neutral concerning jurisdictional claims in published institutional affiliation.

References

1. Amaral Filha W.S., Bernardi M.L., Wentz I., Bortolozzo F. (2010). Reproductive performance of gilts according to growth rate and thickness at mating. *Animal Reproduction Science*, 121: 139-144.
2. Anonymous. (2018). Statewise and item-wise estimates of value of output from agriculture and allied sectors

- (2011-12 to 2015-16). Central statistics office, Ministry of statistics and programme implementation Govt of India. Retrieved from http://mospi.nic.in/sites/default/files/publication_reports/Final11Brochure_30july2018.pdf
3. Anonymous. (2019). Basic Animal Husbandry statistics-2019. Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry & Dairying, Govt of India. Retrieved from https://dahd.nic.in/sites/default/files/BAHS%20%28Basic%20Animal%20Husbandry%20Statistics-2019%29_0.pdf
 4. Borpuzari R.N., J.R. Bora, J. Das, H. Hazarika, D. Hazarika and M. Rahman (2013). Performance of Crossbred (Hampshire X Assam Local) Pigs Maintained on Water Hyacinth Substituted Feed. *Indian Veterinary Journal*, 90 (3): 85 – 86.
 5. Cools A., Maes D., Decaluwé R., Buyse J., Van Kemoen T.A.T.G., Liesegang A., Janssens G.P.J. (2014). Ad libitum feeding during the periprenatal period affects body condition, reproduction results and metabolism of sows. *Animal Reproduction Science*, 145, 130-140.
 6. Hazarika D., T. K. Amonge, R. N. Borpuzari, J. R. Bora, H. Hazarika and A. K. Gogoi (2015). Productive Performance of Crossbred (Hampshire x Assam local) Pigs Maintained on Azolla Protein Substituted Feed. *Indian Veterinary Journal*, 92 (10), 79 – 81.
 7. Karolina Szulc, Ewa Skrzypczak, Janusz T. Buczyński and Tomasz Graczyk (2015). Influence of body weight and age at first insemination of PIC gilts on the results of reproductive performance and piglet rearing. *Scientific Annals of Polish Society of Animal Production*, 11(1), 49-57.
 8. Kumaresan, A., Bujarbarua, K.M., Pathak, K.A., Chhetri, B., Das, S.K., Das A. and Ahmed, S.K. (2007). Performance of pigs reared under traditional tribal low-input production system and chemical composition of non-conventional tropical plants used as pig feed. *Livestock Science*, 107, 294-298.
 9. Kumaresan, A., Bujarbaruah, K.M., Pathak, K.A., Das, A. and Bardoloi, R.K. (2009). Integrated resource-driven pig production systems in a mountainous area of Northeast India: production practices and pig performance. *Tropical Animal Health and Production*, 4, 1187-1196.
 10. Lalremruata C., L. Hmar and G. Kalita (2015). Study on the growth performance and mortality in pre-weaning Burmese piglets reared under field condition of Aizawl, India. *Indian Journal of Anima. Research*, 49 (2), 262-264.
 11. Naskar, S. and Das, A. (2007). Approach for improvement of pig production in northeastern hilly region of India. *Livestock International*, 62(1), 21-23.
 12. Payeng, S, Borgohain, A. and Bora, J.R. (2013). Economics of Pig Production in Organized and Unorganized Sectors. *Indian Journal of Extension Education*, 13(1), 101-106.
 13. Pork-2016 (2016). Retrieved from https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Pork%20-%202016_New%20Delhi_India_7-21-2016.pdf
 14. Panda C. (2018). Characterization and evaluation of Golla pig of undevided Ganjan Distt. MVSc. Thesis, college of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar, Odisha, India.
 15. Rekiel A., Więcek J. and Beyga K. (2011). Analysis of the relationship between fitness of late pregnant and lactating selected sows and lipid parameters of blood, colostrum and milk. *Annals of Animal Science*, 11(4), 485-493.
 16. Snedecor G.N. and Cochran W.G. (1989). Statistical methods, 8th Ed., The Iowa State University Press, Ames, Iowa, USA.
 17. Szyndler-Nędza M., Różycki M., Eckert R., Mucha A., Koska M., Szulc T., (2013) Relationships between chemical composition of colostrum and milk and rearing performance of piglets during a 21-day lactation. *Annals of Animal Science*, 13(4), 771-781.
