Performance of Hampshire crossbred (HD-K75) pigs at village conditions

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Abstract

Performance records of HD-K75 pigs under field condition pertaining to growth traits were collected from three locations belong to three districts viz. Karbi Anglong, Nagaon, and Kamrup (Assam). Data pertaining to 143 pigs were utilized to study the body weight at birth at weaning and at market ages and were classified according to the sex of animal, season of birth and location. The average body weights at birth, at weaning and at market age were found to be 0.807 ± 0.088, 10.81 ± 0.217 and 58.537±0.80 kg, respectively. Sex had non-significant effect on the body. However, females were found heavier (0.813 ± 0.121 kg) than males (0.799 ± 0.013 kg. The phenotypic correlations among the body weights were mostly non-significant except body weight at birth with weaning which was positive and medium and significant (0.26± 0.41) while, with market age was positive and medium but non-significant (0.434± 0.433) and between body weight at weaning and market age was non-significant, positive and medium (0.150± 0.478). Therefore, by providing proper management and breeding practices, there is scope for improvement of these traits.

Keywords: HD-K75 Pigs; Productive trait; Performance; Village Condition

Introduction

The North-East (NE) of India is the best place for piggery rearing because the majority of the population consumes pork, and some tribes use pigs in religious ceremonies. The importance of piggery in the NE region is increasing is evident from the increasing trend of pig population in the region compared to the country as a whole (Muhindro Singh, 2023). According to the 20th Livestock census, the northeastern part of the country houses about 40% of the pig population of the country. The highest population is in Assam (2.10), million), succeeded by Jharkhand (1.28 million), Meghalaya (0.71 million) and West Bengal (0.54 million). Thus, piggery production has ample of scope for development in NE Region. Looking into the tremendous scope for piggery industry in the NER the ICAR established a research center during the Fourth Five Year Plan under the banner of the AICRP on pigs at Assam Agriculture University (AAU). With the objectives of studying the performance of indigenous pigs of Assam and to produce a superior strain by crossing indigenous gilts with boars of purebred Hampshire. Hampshire breed of swine has good productive efficiency in field conditions (Borah et al., 2022). The AICRP on Pig, AAU, Khanapara has developed a new variety of crossbred pig viz. HD-K75 with 75 % Hampshire inheritance and 25% inheritance from indigenous pigs through 16th generations of inter se mating with concomitant selection. The HD-K75 variety of pig was released during October, 2016. Under farm condition this variety of pig is reported to have a comparatively higher litter size and litter weight at birth and at weaning (AICRP on Pig, 2016). The HD-K75 produced at the AICRP on pig, Khanapara also distributed among the farmers. Thus, it is necessary to monitor the performance of this important strain/variety under field condition. The present investigation was therefore undertaken to study the performance of HD-K75 under field condition with the objectives to study the performance of HD-K75 Pigs in respects of some production traits of economics importance and to study the effect of sex, season and location on growth traits.

Materials and method

Performance records of HD-K75 pigs under field condition pertaining to growth traits were collected from three locations belong to three districts viz. Karbi Anglong, Nagaon,and, Kamrup (Assam) comprising four villages viz. Dokmoka, Kumar Gaon, Boko and Kamalpur (one each from Karbi Anglong, Nagaon and two villages from Kamrup).The latitude and longitude of Karbi Anglong 26° 0' 0" North and 93° 30' 0" East, Nagaon 26° 19' 52.914" North and 92° 45' 8.9136" East , and Kamrup 26° 8' 48.7896" North and 91° 13' 21.864" East respectively. Data pertaining to 143 pigs were utilized to study the body weight at birth (0 week), at weaning (60-75 days) and at market ages (6-8 months) in 36 farmers of each 4 numbers of adult animals. The data collected were classified according to the sex of animal, season of birth/farrowing and location. The whole year was divided into four seasons according to the prevailing climatic conditions in the region as pre monsoon, monsoon, post monsoon and winter**.** The HD-K75 pigs under study were reared under semi-intensive and scavenging system mainly in tribal areas. In Nagaon and Kamrup district, it was observed that most of the farmers reared the animals under semi-intensive system. The animal sheds were constructed with locally available materials like bamboo, woods and tin while, few farmers had pakka houses. The animals were commonly fed with rice polish, rice bran, maize bran, leftover rice, vegetables, and locally available grasses in addition to these the pigs were fed mostly with 'jugali' (leftover rice beer) in tribal dominated areas. The relevant information and data required for the present investigation was collected through field survey through questionnaires provided to the farmers and by taking weight measurements (spring balance/weighing balance) on the animals/piglets. The averages and standard errors were calculated on unadjusted data as per standard statistical procedure described by Snedecor and Crochran (1994).

Fig 1 (a) Management of HD-K75 gilt under semi-intensive system in village

Figure 1 (b) Feeding of HD_K75 pigs in village condition

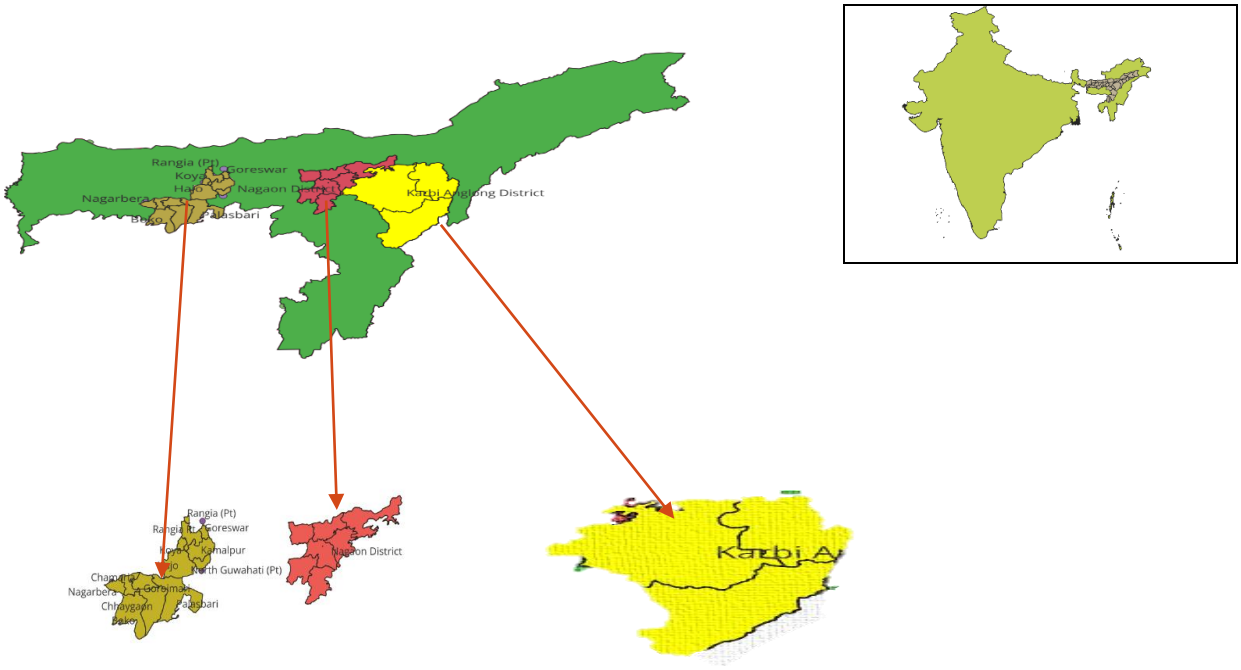

Figure 2.Showing the study area of 3 Districts with Villages

Results and discussion

averages along with standard error for body weights at birth, weaning and adult age for Doom pigs are presented in Table 1.

Body weight at Birth

The Overall Means along with standard errors (SE) in HD- K75 pigs for body weight at birth was found to be 0.807 ± 0. 088. The birth weight estimated in the present study was slightly lower but comparable to report AICRP on pigs (AICRP, 2016). However, Das *et al.* (2023) found comparatively higher body weight at birth in HD-K 75 pigs at nucleus herd (ICAR-All India Co-ordinate Research Project on Pig, Assam Agricultural University, Khanapara, Guwahati, Assam) and another higher body weight at birth was reported by Kadirvel et al. (2023) in niang megha and hampshire inheritance (0.92 ± 0.06 kg). Kumar *et al*. (2018) also was found comparatively higher body weight at birth in ¾ H x ¼ I crossbreds. Kaushik *et al.* (2013) were reported the birth weight of Hampshire and Ghungroo (1.117±0.021) under Organized Farm Condition in Assam. Boro *et al.* (2021) reported higher body weight at birth in Ghungroo pigs reared under farm condition (0.97±0.01). The lower body at birth reported by Rahman *et al.* (2020) in Doom Pigs Under Field Condition of Assam. Therefore, HD-K75 pigs is higher body weight at birth than local indigenous pigs. Differences in sex did not exert any significant effect on birth weight of the genetic group (HD-K75) under study. However, females were found heavier (0.813 ± 0.121 kg) than males (0.799 ± 0.013 kg. Similar reports of sex as not significant source to affect body weight at birth were also reported by Mandal and Kumar (2015). Dube *et al.* (2011), Bocian *et al.* (2012), Lalremruata *et al*. (2015) and Naha *et al.* (2017) could find sex to be a significant source of variation to affect body weight at birth.

Body weight at weaning

The body weight at weaning was estimated to be 10.81 ± 0.217 kg. Similar body weight at weaning was also reported by in graded (3/4 H x ¼ I) inter se pigs at AICRP on pigs, AAU, Khanapara (AICRP, 2016). However, comparatively lower body weight at weaning was found by Das et al. (2023) in HD-K 75 pigs at nucleus herd (ICAR-All India Co-ordinate Research Project on Pig, Assam Agricultural University, Khanapara, Guwahati, Assam), lower body weight was also reported by Aier et al. (2020) in Hampshire x Desi half-bred pigs and Kumar et al (2018) studied on 75% Hampshire pigs. The weaning weight observed in HD-K75 pigs (10.81 ± 0.217 kg) was higher to those of Devi and Kumar (2021) who found weaning weight in graded Hampshire to be 9.34±0.17 kg. at in Chandel district of Manipur. The higher body weight at weaning was also reported by Kaushik et al. (2013), in 45 days body weight of Duroc (12.467±0.21) pigs. However, the body weight at weaning was found

not to be affected by sex. Similar reports of sex as a non-significant source to affect body weight at weaning were also reported by Naha *et el*. (2017), Matabane *et al.* (2018), Devandran *et al.* (2015) in LWY and Desi crosses. On the contrary sex was reported to be significant to affect weaning body weight by Dube *et al.* (2011), Jaishankar *et al*. (2015) and Lalremruata *et al*. (2015).

Body weight at market Age

The body weight at market age was found to be 58.537±0. 802.Compare to the present finding a higher body weight at market age were reported by AICRP on pig, Annual report, AAU, Khanapara (AICRP, 2015-16) and Kumar *et al.* (2018) respectively in ¾ H x ¼ I crossbreds. However, comparatively higher adult body weight of graded Hampshire (69.64±3.17 kg) was observed by Devi and Kumar (2021), and Jayasree et al. (2019) reported in Large White Yorkshire × desi crossbred pigs under hot and humid conditions of India of market age was 65.54±1.32 kg. Chaurasia (2016) also reported the higher body weight at market age of Cross Breed Hampshire and Local Pigs 94.72 ± 0.66 kg and 60.70 ± 1.02 kg respectively in Field Condition in Zunheboto District. On the other hand, lower body weight at market age is reported by Borah *et al.* (2017) in Ghungroo (44.21±0.97 kg) and non-descripted (36.67±0.88) local pig of Assam in comparison to the present findings. Kadirvel *et al.* (2021) reported in Wak Chambil a Garo hills in Meghalaya indigenous pig at 10^{th} months body weight 34.63±2.02 kg. Therefore, the current finding of HD-K75 pigs is comparatively better performance than the indigenous pig of Assam and North eastern region. The body weight at market age was not found to be affected by sex and was similar those reported by Devendran *et al*. (2015). However, Das *et al.* (2023) reported that the effect of sex on body weight at different ages of growth under his study were highly significant ($p<0.01$). Dube *et al.* (2011) and Naha *et al.* (2017) were also found affected by sex at market age.

Table 1. Average (mean±se) body weight of pigs at different ages according to sex

Sources of variation	Body Weight (Kg)		
	At Birth	At Weaning	At Market age
Sex			
Male	0.799 ± 0.013 (62)	10.716±0.174 (58)	56.575±1.031 (51)
Female	0.813 ± 0.121 (81)	10.888±0.179 (76)	59.908±1.134 (73)
Overall Mean ± SE	0.807 ± 0.09 (143)	10.81 ± 0.22 (134)	58.537±0.80 (124)

Values within parentheses are the number of observation. Superscript with similar letters do not differ significantly

Phenotypic Correlation among body weights at different ages

The body weight at birth was found to have low and positive correlation but significant with body weight at weaning (0.26±0.41) and medium but non-significant with market age (0.434±0.432). Similar findings with low and positive correlations among the body weights at birth with weaning weight was reported by Jankowiak et al. (2020) in Indigenous pigs of Northern Ghana. The present finding is lower than reported by Rokde et al. (2013) the phenotypic Correlation for sow productivity traits which ranged from 0.94±0.2 to 0.81±0.3 and 0.74±0.01 to 0.82±0.02 in LWY and TMW grades respectively. Pandey et al. (2010) found high and positive correlation between body weights at birth with body weights of later ages in Landrace, desi and their half-brads pigs. Sharma *et al.* (2013) reported the phenotypic correlation at 4th month of age to be 0.53 ± 0.09 in LWY cross. Phenotypic correlation of body weight at weaning with body weight at market age was very low positive and non-significant (0.150±0.478). However, Ganesan *et al.* (2013) were reported the high and positive correlation among the post weaning body weight in cross bred pigs. Bayan *et al.* (2024) also mentioned that in 75% H 25% I pigs where the phenotypic correlation among body weight at different ages to be positive and highly significant and the phenotypic correlation coefficients among body weights at post weaning ages were found to be positive and high in 75% H 25%, I pig and moderate to high in T&D pigs.

Conclusion

In the present study, it may be concluded that by providing proper management and breeding practices, there is scope for improvement of these traits. The findings of the present study indicated that Hampshire crossbred (HD-K75) pigs can perform better in terms of production potential and adaptability even on existing low input rearing systems at village condition of Assam.

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References

1) 20th livestock census (2019). 20th Livestock Census. Department of Animal Husbandary, Dairying and Fisheries, Ministry of agriculture, GOI, New Delhi.
2) AICRP (2015-16). Annual Report, Assam Agricultural University, khanapara, Guwahati.
3) AICRP (2016), AICRP on Pig, Assam Agricultural University khanapara, Guwahati.
4) Aier,T., Zaman,G., Aziz, A., Goswami, RN, Kalita,D., Saharia,J.,6 and Ahmed,K.,(2020). Studies on Reproductive Performance of Hampshire X Desi Half-Bred Pigs. Veterinary Research International; **8(2):**148-151.
5) Bayan, J., Zaman, G.U., Phookan, A., Akhtar, F., Saharia, J. and Sulabh, S. (2024). Genetic Parameter Estimation for Growth Traits in HD-K75 Pigs. Agricultural Science Digest. 1-5. doi: 10.18805/ag.D-6063.
6) Bocian,M., Jankowiak,H., Cebulska, A., Wiśniewska, J., Frątczak,K.,Włodarski,W.,and Kapelański, W. (2012). Differences in piglets sex proportion in litter and in body weight at birth and weaning and fattening results. Journal of Central European Agriculture, **13(3)**:475-482.
7) Borah,S., Samajdar,T., Bharti, P.K., Das, T.K.,4 and Marak, G.(2017). Performance of Ghungroo and Ghungroo × Hampshire pigs under low input production system in climatic condition of Garo hills of Meghalaya. Indian Journal of Animal Sciences **87 (4):** 523–524, Short communication.
8) Borah, P., Bora, J.R., Haque, A., Borpuzari, R., Hazarika, S., Konwar, P. 2022. Effect of housing system on carcass characteristics of crossbred (Hampshire x Assam local) pigs. Journal of Livestock Science 13: 208-212 doi. 10.33259/JLivestSci.2022.208-212
9) Boro, P., Bharali, D., Sarma, M., Sonowal,M., Saharia, J., Brahma,J., Kalita,MC, and Thakuria,J., (2021). Agricultural University, Guwahati. Performances of Ghungroo pigs reared under farm condition. Journal of Entomology and Zoology Studies; **9(1):** 2265-2267.
10) Chaurasia,R.K., (2016). Comparative Performance of Cross Breed Hampshire and Local Pigs in Field Condition in Zunheboto District. Indian Journal of Hill Farming, **29 (2):** 160-161.
11) Das,E., Kalita, D., Goswami, RN., Phookan, A., Khanikar, D, and Deka, N., (2023). Growth performance of HD-K75 Pigs in the original nucleus Herd. International Journal of Veterinary Sciences and Animal Husbandry; **8(6):** 24-28.
12) Devendran, P., Gopinathan, A.; Murugan, M. and Cauveri, D. (2015). Pre-weaning body weights of Large White Yorkshire (50%) pig crosses over generations. Indian Journal. Animal. Research., **49 (3)**: 284-287.
13) Devi, A., and Kumar, H., (2021). Comparative performance of graded Hampshire and Berkshire pig in Chandel district of Manipur. Journal of Entomology and Zoology Studies; **9(1):** 1760-1763.
14) Dube,B.; Mulugeta, S.D; Van Der Westhuizen, R.R. and Dzama, K. (2011). Non-genetic factors affecting growth performance and carcass characteristics of two South African pig breeds**.** South African Journal of Animal Science, **41 (2)**:161-176.
15) Ganesan, R.A., Dhanavanthan, P., Kumarasamy, P., Murugan, M., & Jaishankar, S. (2013). Factors influencing growth performance and estimation of genetic parameters in crossbred pigs. Journal of Agriculture and Veterinary Science (IOSR-JAVS) **5(6):** 63-71.
16) Jaishankar, S., M. Murugan and H. Gopi (2015). Comparative pre-weaning performance of 75% Large White Yorkshire crossbred pigs of fifth and sixth filial generation. International Journal of Science, Environment and Technology. **4**(4): 1236.
17) Jankowiak H, Balogh P, Cebulska A, Vaclavkova E, Bocian M, Reszka P (2020): Impact of piglet birth weight on later rearing performance. Veterinarni Medicina**, 65(11):** 473–479.
18) Jayashree, P., Sivaselvam, S N, Venkataramanan, R., Sundaram, S M., Gourimanohari, KV., Arthy, V., and Balasubramaniam, D., (2019). Genetic evaluation including maternal effects in Large White Yorkshire × desi crossbred pigs under hot and humid conditions of India. Indian Journal of Animal Sciences **89(7):** 752–757.
19) Kadirvel, G., Kumar,R., Borah,S., SingH,N.S., Devi,Y.S., Jamatia,K., Deori.S., (2021). Phenotypic characterization and performance evaluation of Wak Chambil: A unique indigenous pig of north east region of India. Indian Journal of Hill Farming; **(34):**75-81.
20) Kadirvel, G., Devi, Y. S., Naskar, S., Bujarbaruah, K. M., Khargariah, G., Banik, S., Singh, N. S., & Gonmei, C. (2023). Performance of crossbred pigs with indigenous and Hampshire inheritance under a smallholder production system in the Eastern Himalayan hill region. Frontiers in genetics, 14, 1042554. https://doi.org/10.3389/fgene.2023.1042554

21) Kaushik, P.; Banik, S.; Naskar, S.; Barman, K.; Das, A.K and Sarma, D.K. (2017). Effect of different genetic and non-genetic factors on pre weaning litter and growth performance of pigs. Indian Journal of Animal Resource., **51 (1):** 179-181.
22) Kumar, R.; Mandal, B.; Kumari, N. and Patel, N. (2018). Performance of different genetic groups of pigs maintained under AICRP on Pig. International Journal of Current Microbiology and Applied Sciences; **7**: 822-826.
23) Lalremruata, C., Hmar, L. and G. Kalita, G. (2015). Study on the growth performance and mortality in pre-weaning Burmese piglets reared under field condition of Aizawl, India. Indian Journal of Animal Resource., **49 (2):** 262-264.
24) Matabane, M.B., Nephawe, K.A., Thomas, R.S. and Ayanda (2018). Pre-weaning growth performance of piglets at smallholder farms in Gauteng province. Journal of Agricultural Science., **10**(4):18-23.
25) Mondal S.K., Kumar, A., (2015). Genetic evaluation of pre-weaning growth traits in Landrace X Desi piglets. Indian Journal of Animal Research. **49(2):** 273-275. doi: 10.5958/0976-0555.2015.00116.8.
26) Muhindro Singh, N., 2023. Study on status of small scale pig rearing in upland tribal areas of North East India, Journal of Livestock Science 14: 47-52 doi. 10.33259/JLivestSci.2023.47-52
27) Naha, B.C., Gaur, G. K., Patel, B. H. M. and Sahoo, N.R. (2017). Growth and litter traits in crossbred pigs across the non-genetic factors. Indian Journal of Animal Research, **51**(4):798-800.
28) Pandey A. and Singh S.K. (2010). Factors affecting body weight in landrace, desi and their halfbred pigs. International Journal of Molecular Biology, **1(1):**21-24.
29) Rahman,M., Phookan,A., Zaman,G., Das,A., Akhtar,F., Hussain,J.,and Choudhury, H., (2020). Growth and Reproductive Performances of Doom Pigs Under Field Condition. Veterinary Research International; **8(2):**73-77.
30) Rokde, N.K.; Thakur, M.S.; Parmar, S.N.S. and Tomar, S.S. (2013). Effect of various genetic and non-genetic factors on reproductive traits in Large White Yorkshire cross-bred and Tamworth cross-bred pigs. Journal of Animal Research, **3(2):** 173-178.
31) Sharma, G.; Arora, J. S.; Kumar, D.; Mahajan, V. and Thakur, M. S. (2013). Genetic studies on sow productivity traits of Large White Yorkshire crossbred pigs. International Journal of Bioinformatics and Biological Science: **1 (1) :**19-26.
32) Snedecor, G.W. and Cochran, W.G. (1994). Statistical methods. Oxford and IBH publishing Co., Calcutta.