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Reproductive performance of HD-K75 pigs under field conditions

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Abstract

A study was conducted in three districts of Assam, viz. Nagaon, Kamrup, and Karbi Anglong to evaluate the reproductive performance of HD-K75 (Hampshire X Desi) pigs in the field conditions under the semi-intensive type of rearing system. The mean for age at first service (AFS), age at first farrowing (AFF) and farrowing interval (FI) were found to be 256.900 ± 1.497 , 389.200 ± 3.946 and 228.243 ± 2.507 days, respectively. The estimates of phenotypic correlations of body weight at birth and at weaning with those of AFS, AFF and FI were low, negative and non-significant (-0.195 and -0.175 , -0.181 and -0.175 ± 0.146 , -0.158 ± 0.191 and -0.0242 ± 0.191 respectively). However, the correlation of body weight at market age with at AFF and FI was found to be non-significant, which were low and positive (0.049 ± 0.689 and 0.165 ± 0.174) except with AFS, which was low and negative (-0.159 ± 0.188). The study indicates that the reproductive performance of these animals shows scope for improvement. Therefore, implementing improved management and breeding strategies can enhance the reproductive efficiency of HD-K 75 pigs under field conditions.

Keywords: HD-K75 pigs, reproductive traits, performance, under field conditions

Introduction

Piggery is one of the important animal husbandry activities and plays a critical role in sustaining the livelihood security of pig farmers in India. With the change in food habits and increasing urbanization, the demand for pork and value-added pork products is expected to increase, which projects greater opportunities in pig rearing (Rajak *et al.* 2024) ^[1]. The North-East (NE) India is characterized by diverse topography and a rich environment, comprising eight states: Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Tripura. The NE region can be considered as the most suitable region for piggery development as pig production and consumption are an integral part of the local communities, and the popularity of pork is increasing day by day as a source of animal protein (Mehta and Bhattacharjee, 2024). As per the 20th Livestock Census of India (<http://dahd.nic.in>), the total pig population in the country is 9.06 million, accounting for approximately 1.7% of the total livestock population (DAHD, 2019 and Singh, 2023) ^[3]. In 2019, the pig population in the NE region stood at 4.24 million, reflecting a 7.29% increase from the previous census and accounting for 46.85% of India's total pig population. Assam had the highest pig population at 2.09 million, which shared alone 49.47% of the total pig population of the NE region. Notably, Assam, Meghalaya, and Mizoram showed growth in pig numbers, with rural areas experiencing a 5.51% increase and urban areas witnessing a significant 33.78% rise. Thus, piggery production has ample scope for development in the Region. Looking into the tremendous scope for the piggery industry in the NER, the ICAR established a research centre during the Fourth Five-Year Plan under the banner of the AICRP on pigs at Assam Agriculture University (AAU). 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. 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 in October 2016. Thus, it is necessary to monitor the performance of this important strain/variety under field conditions and current study was to evaluate the reproductive performance of HD-K75 pigs under field condition.

Materials and Methods

The study investigated the reproductive performance of HD-K75 pigs in three districts Nagaon, Kamrup, and Karbi Anglong. The latitude and longitude of the study areas were 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 from 143 pigs were utilized to study the age at first service, age at first farrowing and farrowing interval. The relevant information and data required for the present investigation were collected through a door-to-door field survey using questionnaires provided to the farmers. The body weight for adult animals was taken with a spring balance, and for small animals it was taken with a pan balance. During the field survey, it was observed that most farmers practised a semi-intensive rearing system, utilizing locally available materials for constructing sheds. The pigs were fed primarily consisting of rice polish, rice bran, maize bran, leftover rice, vegetables, and grasses. Additionally, in tribal-dominated regions, pigs were commonly fed 'jugali' (fermented rice beer residue) and cooked taro leaves. The farmers had limited knowledge of animal healthcare management, and natural breeding was the only common practice. The data were subjected to simple statistical analysis and as per Snedecor and Cochran (1994) [19].



Fig 1: Management of HD-K75 sow under field conditions



Fig 2: Showing HD-K75 piglets with the sow under field conditions

Results and Discussion

Age at first service (AFS): The overall means of AFS in the present study was 256.900±1.497 days. A comparable estimate of AFS was obtained by Devi and Kumar (2022) in graded Hampshire (255.00±4.11days) and Aier *et al.* (2020) in Hampshire x Halfbred desi pig (257.663±4.362 days). Comparatively higher estimates were reported by Guldass *et al.* (2015) in Hampshire and Niang Megha crossbred pigs, which were 300.28±0.41 days. A higher age at first service (268.02±5.46 days) in crossbred pigs was also observed by Kaushik *et al.* (2019) [15]. Similarly, Singh *et al.* (2020) [4] observed a higher age at first service in the Rani crossbred variety (Hampshire x Ghungroo), which was recorded as 332±5.62 days in Kiphire District, Nagaland. However, reported the lower age at first service (240.94±0.16 days) in Hampshire and Ghungroo crossbred pigs. A lower age at first service, 240.34±1.34 days, was also reported in crossbred pigs by Boruah *et al.* (2021).

Age at first Farrowing (AFF): The overall mean of AFF in the present study was 389.200±3.946 days. Comparable result (387.23±3.90 days) was also reported by Kumari and Sreenivasa (2010) [18] in crossbred pigs, and a similar finding was also reported by Kaushik *et al.* (2019) [15] in crossbred pigs (390.00±7.51day days). The higher age at first (417.25b±2.52 days) farrowing was also observed by Kadirvel *et al.* (2020) [4] in Hampshire and Niang Megha crossbred pigs and Chaurasia (2016) [6] in Hampshire crossbred pigs. Borah *et al.* (2017) reported a higher age at first farrowing of 450.3±0.39 days in Ghungroo × Hampshire pigs under low input production system in climatic condition of the Garo hills of Meghalaya. However, Aier *et al.* (2022) [9] obtained comparatively lower age at first furrowing (AFF) 356.554±3.203 and 371.006±4.470 days in LR x Desi and Hampshire x Desi Half Bred cross pigs, respectively, as compared to the present finding. Also, a comparatively lower age at first farrowing was obtained by Devi and Kumar (2021) [16] and Chakurkar *et al.* (2021) [7] in graded Hampshire (376.80±4.87 days) and crossbred pigs (293±17.24 days).

Farrowing Interval (FI): The overall mean of FI in the present study was found to be 228.243±2.507 days and was almost corresponding to the findings value of 214.4±16.6 days and 211.9±1.68 days by Pandit *et al.* (2011) [8] in H x Nagpuri and Pakhiribas x Nagpuri, respectively and Tribout *et al.* (2010) in 87.5% H × 12.5% NM crossbred pigs, which was

220.50±1.75 days. However, Reddy *et al.* (2013) [17] reported comparatively higher estimates of farrowing interval, with values of 283.87±3.00 days in ½ LWY x ½ I and 281.73±0.62 days in ¾ LWY x ¼ I crossbred pigs. Comparatively lower values of farrowing interval (206.32±1.53 days) were reported by Kumari and Sreenivasa (2010) [18] in crossbred pigs, while Kadirvel *et al.* (2020) [4] reported a slightly lower value of 202.46±1.76 days in Hampshire and Niang Megha (HN-75) crossbred pigs. Aier *et al.* (2022) [9] recorded even shorter farrowing intervals in Hampshire x Desi half-bred pigs with an average of 182.978±1.759 days. Notably, also reported the lowest age at furrowing interval with values of 150.96±0.2 days in Hampshire x Ghungroo and 180.5±0.17 days in Hampshire x Niang crossbred pigs.

Phenotypic correlation among the productive and reproductive traits

The present study's correlation coefficient ranges from -

0.021±0.864 to + 0.165±0.174 (Table 1). The phenotypic correlation of body weight at birth and weaning with all the reproductive traits, viz. age at first service (AFS), age at first farrowing (AFF) and farrowing interval (FI) was low and negative, non-significant (-0.195±0.106, -0.181±0.135 and -0.021±0.864, -0.175±0.146, -0.158±0.191 and -0.024±0.191 respectively). Similar observations of low, negative, and non-significant, except with FI in HD-K75 pigs, were reported by Phookan *et al.* (2024) ^[10]. Negative phenotypic correlations were observed between reproductive traits and body weight at birth and weaning by Le and Trinh (2024) ^[11] in landrace crossbreds in various regions of Vietnam. While the phenotypic correlation of body weight at market age with AFF and FI was also low and non-significant but positive (0.049±0.689 and 0.165±0.174, respectively), except with AFS, which was low and negative (-0.159±0.188). Phookan *et al.* (2024) ^[10] also reported a comparable observation with the current finding, in HD-K75 pigs, revealing a low, negative and non-significant correlation of body weight at market age with age at first service (AFS) (-0.55) and age at first farrowing (AFF), (-0.057), but positive, low and non-significant correlation with farrowing interval (FI), (0.137).

Table 1: Correlation of the body weight at different ages with age at first service, age at first farrowing and farrowing interval

Traits	Age at First Service (AFS)	Age at First Farrowing (AFF)	Farrowing Interval (FI)
Body weight at birth	-0.195±0.106 (NS)	-0.181±0.135 (NS)	-0.021±0.864 (NS)
Body weight at weaning	NS	NS	NS
Body weight at market age	NS	NS	NS

NS=Non-Significant

Conclusion

The HD-K75 pigs developed by ICAR-AICRP on Pig, AAU, Khanapara, Guwahati, Assam, exhibit superior reproductive performance and better adaptability across various conditions of Assam. Their reproductive traits are comparable to those of other 75% Hampshire crosses and similar graded exotic breeds. These findings suggest that, with proper management and breeding practices, there is significant potential to enhance production under existing field conditions.

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Conflict of Interest

The authors declared that there is no conflict of interest for this study.

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