Quest Journals
Journal of Research in Agriculture and Animal Science
Volume 9 ~ Issue 12 (2022) pp: 44-49
ISSN(Online) : 2321-9459
www.questjournals.org

Research Paper

Growth and Reproductive Performance of male *Tenyivo* pig under farm condition

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ABSTRACT
The present work entitled "Growth and Reproductive performance of male Tenyivo pig under farm condition" was conducted using twenty (20) weaned male Tenyivo piglets in the farm of Indian Council of Agricultural Research - All India Coordinated Research Project on Pig (ICAR-AICRP on Pig), Nagaland Centre NU, Medziphema Campus. The average weight at birth and at weaning recorded were 0.41±0.10, 0.45±0.09, 0.45±0.16 and 0.58±0.01 kgs and 4.32±0.43, 4.78±0.47, 4.56±0.40 and 3.40±0.44 kg of the pens one to four respectively. The exhibition of sexual behavior recorded at an early age of 56±1.38, 45±1.87, 49±2.11 and 57±0.84 days for pen one to four respectively. Prominent sexual acts like playful mounting of pen-mates, sniffing around and avoiding feeds and water were observed. The average age and weight at first mating recorded were 56±1.04, 57±1.02, 56±1.08, 59±0.86 days and 4.95±0.32, 4.85±0.42, 4.43±0.43 and 4.55±0.40 kg respectively for pen one to four. Thirty percent (30%) morbidity and fifteen percent (15%) mortality were recorded during the entire study period.

***Keywords**: Reproductive, Tenyivo, intensive, weaning, sexual behavior, morbidity, mortality.*

***R**eceived 06 Dec., 2022; **R**evised 18 Dec., 2022; **A**ccepted 20 Dec., 2022 © The author(s) 2022.*
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I. INTRODUCTION

Animal husbandry and livestock sectors are essential for rural livelihood and economic development of the country. Among the livestock species, pig plays an important role, being reared by socio-economically weaker sections of the society which consisted a large population of the country. It provides income for the family needs anytime of the year, and as an invaluable source of protein and supply of manures for kitchen garden and fields. Pig farming does not require huge investment on buildings and equipments and has good potential for the weaker society ensuring nutritional and economic security. Seventy percent of the pig population in India is reared under traditional small holder with low input demand system consisting of a simple pig-sty utilizing locally available vegetables, food grains, and agricultural by-product along with kitchen wastes as feeds.

The North Eastern part of India consists of high proportion of tribal people and rearing of pig is an integral part of their way of life since time immemorial. Most of the people in this region are non-vegetarian and a good number of people consume pork meat (Kumaresan et al., 2007). There is a high demand for pork meat in this region as it has a good source of protein. People mostly prefer pork meat from locally raised pig from unorganized farming system. The people of north eastern part of India prefer mostly fresh cut local meat over chilled frozen meat because of either consumer perceptions or cultural perceptions (Johari *et al.*, 2014). These regions of India namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura are characterized by marginality, inaccessibility, fragility, ethnic heterogeneity and diversity of ecosystem (Naskar and Das, 2007). The ICAR National Bureau of Animal Genetic Resources (NBAGR), India have registered a total of seven pig breeds, out of which four breeds are from the North East region viz. Doom, Niang Megha, Tenyivo and Zovawk.

Nagaland is one of the eight states of North East India and a tribal inhabited mountainous state with non-vegetarian food habits and agriculture as main occupation of the inhabitants. It has the highest per capita consumption of pork meat among the North East India. As per the 20th Livestock Census (2019), the total pig population in the Country was 9.06 million and 0.40 million in Nagaland (www.vikaspedia.in). Backyard pig rearing is an integral part of Naga tradition and plays a significant role both in livelihood and sociocultural practices of the tribal farmers. Pigs among the livestock animals are well suited to the people of this region as there is no social taboo in pig farming and pork consumption. Pigs exhibit good growth rate, better feed conversions, prolific in nature and adapt well to different climatic conditions. *Tenyivo* pigs have a strong and long tapering snout, small erect ears and bright alert eyes. It is predominantly black in colour with white markings on the forehead, flanks and legs. The tail is long and usually ends with a white switch. Adult pigs weigh from 35 to 50 kg. The estimated population is about 60,000 to 70,000. Another feature of *Tenyivo* is that it possesses excellent motherly quality and has very good meat quality with a distinctive flavor. The indigenous pig of Nagaland in the earlier days scavenges in and around the village dwellings and fields. However, with the change of mindset and awareness the people started to pen the family pigs in locally constructed pig houses. *Tenyivo* pigs, indigenous to Nagaland were certified by the Breed Registration Committee of the Indian Council of Agricultural Research on 21st June 2016 with Accession No.: INDIA_PIG_1400_TENYIVO_09004). The breed is found in the districts of Kohima, Phek and Dimapur of Nagaland and Senapati district of Manipur (morungexpress.com). Tenyivo pigs have small erect ears with bright alert eyes. They have a strong and long 3 tapering snout. The pig is predominantly black in colour with white markings on the forehead, legs and flanks. Due to the extensive practice of crossbreeding and upgrading of local pigs, the breed is under threat of losing its genetic purity and decreasing in population. This study was initiated to generate key information particularly on reproductive performance and breeding practices of *Tenyivo* swine production systems. The findings from the study can be used to develop research strategies aiming to improve Nagaland swine breeds' production and productivity with the final goal of enhancing farm profitability, ensuring sustainable production and improve the livelihoods of the swine producers in Nagaland. Hence the present study entitled "Growth and Reproductive performance of male *Tenyivo* pig under farm condition" was conducted at ICAR-All India Coordinated Research Project (AICRP) on pig, Nagaland Centre, Department of Livestock Production & Management, School of Agriculture Science and Rural Development, Nagaland University, Medziphema Campus" with the following objectives.

II. MATERIALS AND METHODS

The present work entitled "Growth and Reproductive performance of male *Tenyivo* pig under farm condition" has been proposed with the objective to study the growth performance, reproductive age, sexual behavior and to record the morbidity and mortality rate of male *Tenyivo* pig under farm condition of Medziphema area.

A total number of twenty (20) male *Tenyivo* piglets aged between thirty to sixty five (30-65) days were selected from the pig farm of Indian Council of Agricultural Research- All India Coordinated Research Project on Pig (ICAR-AICRP on Pig), Department of Livestock Production and Management, School of Agricultural Sciences and Rural Development (SASRD), Nagaland University, Medziphema Campus. All the selected experimental animals were ear tagged for proper identification using a plastic ear tag (Photo Plate- 3C) at the age of fifteen (15) days. The experimental observation for sexual behaviors of the experimental animal commenced from 15th December 2021 till 15th February 2022.

The experimental data collected were statistically analyzed as per the standard statistical procedure as prescribed by Snedecor and Cochran (1994). All the statistical analysis was performed using Microsoft excel.

III. RESULTS AND DISCUSSION

Body weight of male Tenyivo piglets at birth

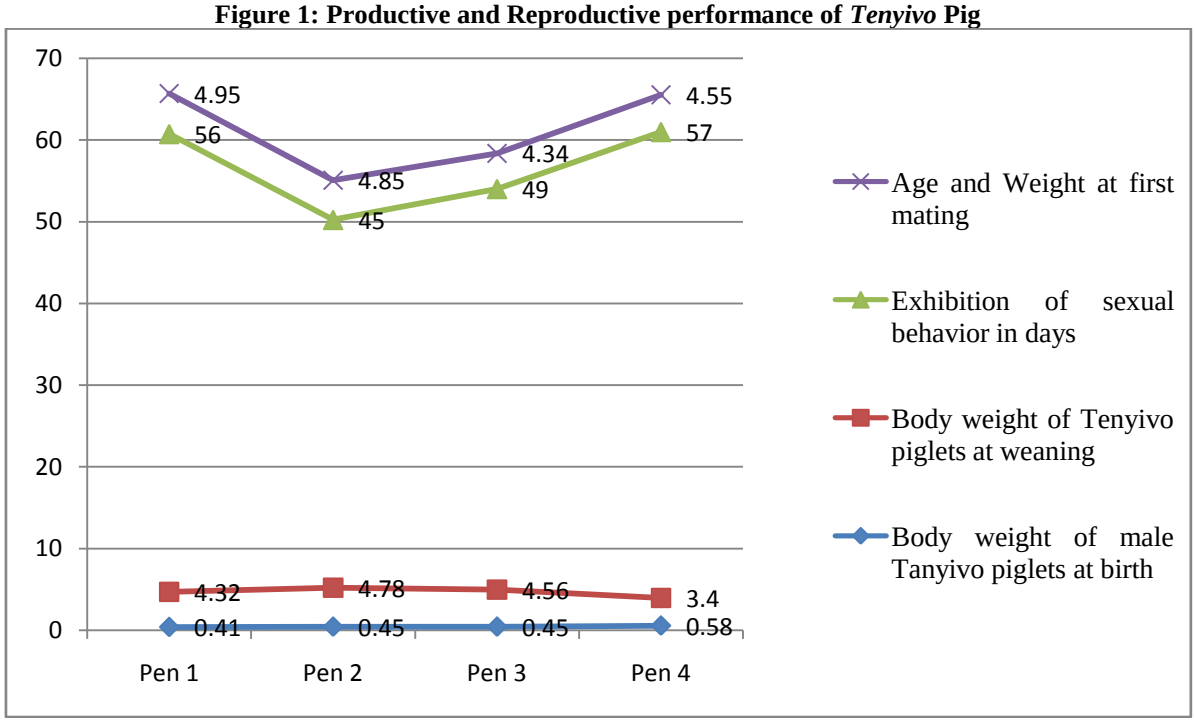
Average weight of *Tenyivo* piglets at birth recorded from intensive housing system were 0.41±0.10 kg, 0.45±0.09 kg, 0.45±0.16 kg and 0.58±0.01 kg for pen 1, 2, 3 and 4 respectively and the finding was found similar with reports of Bendangyanger *et al.,* (2009), Dandapat *et al.,* (2010), Nath *et al.,* (2013) and Sahoo *et al.,* (2012) who reported the birth weight as 0.47±0.02 kg, 0.47±0.15 kg, 0.49±0.31 kg, 0.48 ± 0.23 kg and 0.64 ± 0.02 kg for the local pigs of Nagaland, Sikkim, Khasi hills and Niang Megha breed respectively. However, higher birth weight were recorded from Mizoram nondescript local and Ghrungroo pigs as 0.86 ± 0.08 kg and 0.96±0.02 kg as reported by Kumaresan *et al.,* (2007) and Sahoo *et al.,* (2012) respectively and the variation in weight may be due to its unique breed characteristics and management system.

Body weight at weaning

The average weaning period of indigenous *Tenyivo* piglet ranged from 42-65 days under intensive housing system of management conditions, and all the selected piglets for the present study were weaned at

forty-two (42) days of age. The average weaning weight recorded from pen one (1) to four (4) were 4.32±0.43 kg, 4.78±0.47 kg, 4.56±0.40 kg and 3.40±0.44 kg respectively. The present study records were found to be similar to the report made by Nath *et al.,* (2013), Sahoo *et al.,* (2012) and Zosanpuii *et al.,* (2020) as 4.41±0.16 Kg, 4.90±0.33 kg and 5.47±0.13 kg for Zovawk of Mizoram local, Sikkim local and Niang Megha respectively. The similarity of the breeds weaning weight may be due to the almost similar climatic condition of the region and the small breed characteristics of the region.

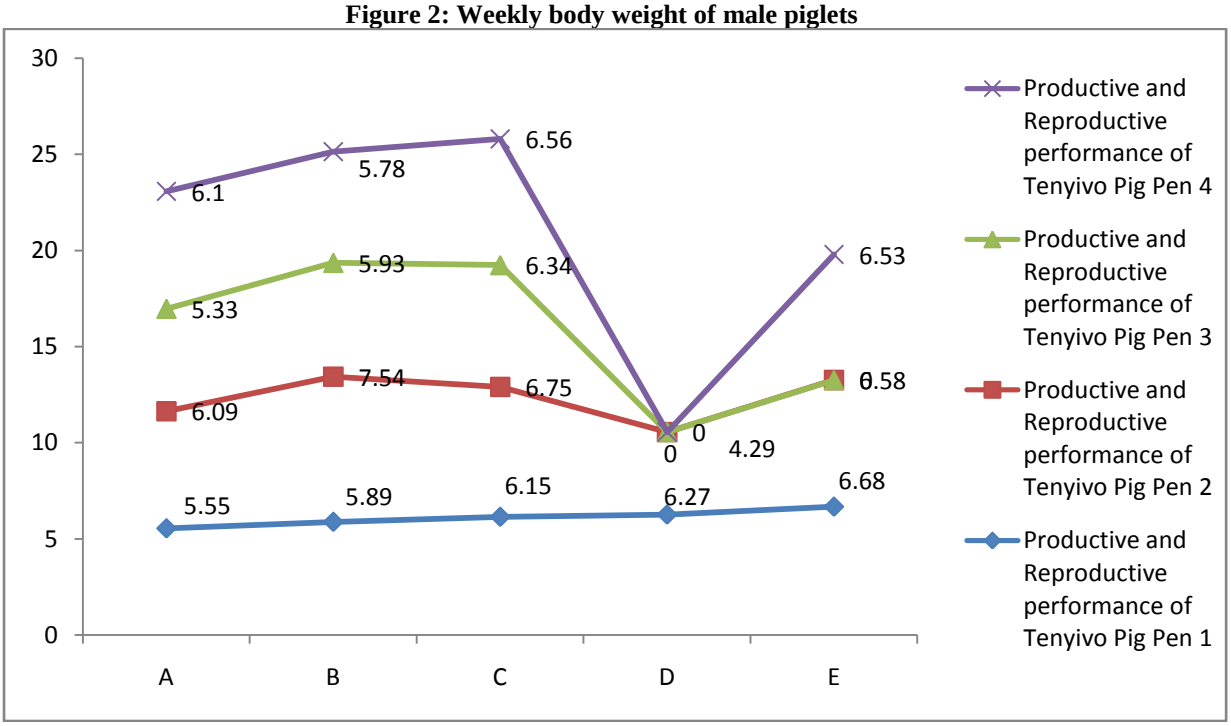
Figure 1: Productive and Reproductive performance of *Tenyivo* Pig



Weekly body weight of male piglets

The weekly body weight of male piglets recorded for animal number A1, A2, A3, A4, A5; B1, B2, B3, B4 B5; C1, C2, C3, C4, C5; D1, D2, D3, D4 and D5 were 5.55±0.52 kg, 5.89±0.57 kg, 6.15±0.46 kg, 6.27±0.52 kg, 6.68±0.53 kg, 6.09±0.52 kg, 7.54±0.52 kg, 6.75±0.59 kg, 4.29±0.44 kg, 6.58±0.51 kg, 5.33±0.54 kg, 5.93±0.43 kg, 6.34±0.56kg, 6.10±0.50 kg, 5.78±0.45 kg, 6.56±0.42 kg and 6.53±0.44 kg respectively from pen 1, 2, 3 and 4 on intensive housing system. From pen 1, all animals have gained higher body weight at week VII where animal number A4 and A5 growth performances were good and A2 has shown the maximum body weight gain of 7.91 kg followed by A5 with 7.87 kg. From Pen 2, animal number B2 growth performance is good in almost all the weeks and in the VII and VIII weeks, all the animal body weight gains are well performed. Similarly, for Pen 3 and 4 all the animals have gain their weight and growth performances were good, except for animal number C4, C5 and D4 have died. After the piglets were weaned, their growth performances have decreased due to lack of interest in feeding and drinking of water thus, giving a mortality rate of fifteen percent (15%).

Figure 2: Weekly body weight of male piglets



Sexual behavior

Sexual behavioral actions like playfully running around, not showing interest in feeding, sniffing in the air, nagging and mounting the pen mates are observed and recorded. The average age in days was recorded on exhibiting any of the sexual behavior mentioned above and the average age recorded were fifty-six (56±1.38), forty-five (45±1.87), forty-nine (49±2.11) and fifty-seven (57±0.84) days of age for pen number one to four respectively. The piglets under observations exhibited playful sexual actions like mounting pen mates as early as forty-eight (48) days of age and latest by sixty (60) days and by the later age all the male piglets showed sexual drives. The actions and sexual proclivities as influenced by complex interactions between the internal and external environments beside the testicular steroids, particularly testosterone, that maintain sexual behavior and it is evident that early hormonal effect is exhibited in *Tenyivo* male piglets at an early age of forty-eight days of age as presented in the present study. Similar report of early puberty age of two months of age by Kumaresan *et al.*, (2008) in non-descript local pigs of Mizoram is in agreement with the present study. However, Zosangpuii *et al.*, (2020) recorded 143.20±1.44 days of puberty age in Zovawk pigs, these variations maybe due to differences in the internal and external environmental affect as well as the differences in managements systems.

Age and weight at first mating

The average age at first mating and weight at first mating under intensive housing system is given in the graphically. The present study recorded thirty-five percent (35%) of the experimental animals in successful mating when introduced to female in heat. The piglets number A2, B1, B4, C4, C5, D4 and D5 were positive in mounting the females for matting at the age of 56, 56, 67, 56, 53, 58 and 61 days and the corresponding weight at first matting were 4.95 kg, 4.73 kg, 3.14 kg, 4.34 kg, 4.20 kg, 4.55 kg and 4.59 kg respectively. Kumaresan *et al.*, (2008) also reported early sexual maturity in the local male piglets of Mizoram that could impregnate the female at an early age of 108.8±8.0 days and this could be an inherent phenomenon and due to genetic factors. The remaining sixty-five (65%) percent of the experimental piglets under observation were all showing signs of sexual maturity but intensity of the sexual drive was low and unable to mate the rather matured adult female sows much bigger and taller as compared to the smaller piglets (Photo Plate 4C). By the age of hundred two days all the male piglets has possibility to mate successfully, though further recording discontinued for the present study which came to the end observation period.

Morbidity and mortality rate

The piglets under observation were noted daily for normal activities like proper feeding and drinking, defecation and urination, alert look with clean eye discharges and smooth body coat. At the onset of experimental period animal number A2, A4, B4, C3, C4 and D4 of pen number one, two, three and four respectively were often observed to be taking less feeds and water with no prominent symptoms. The recorded body temperature was within the normal range of 101.5^0 F to 102.2^0 F taken in the morning hours, indicated

clinically normal yet not performing well like the other pen mates. These were marked as poor in performance with no signs of specific illness except in poor growth rate. Thirty percent (30%) morbidity percentage was recorded during the observation period. However, the sexual drives of these animals were graded as active with high alertness and trying to escape from the pen to performance on the female in heat. The high sexual drive of these piglets may be the cause of the morbidity of thirty (30%) percent. During the observation period animal number C3 and C4 from pen number three and D4 from pen number four died giving a mortality rate of fifteen (15%) percent. Boro *et al.,* (2016) reported mortality rate as 25.15±0.79% varying from 25-30% and commented that the desi local piglet mortality to be lower compared to purebred and crossbred pigs. Singh *et al., (*2019) also reported 32% mortality in *Tenyivo* pigs under intensive management system in the subtropical condition of Nagaland. Therefore, the present study record of 15% mortality can be accepted as within permissible percentage as compared to the reports of other workers. This mortality rate of the experimental animals could be due to hyper active sexual drive, craving for sex and staying away from normal feeds and water consumption, which lead to starvation, dehydration and dead due to exhaustion.

IV. CONCLUSIONS

The present study recorded the productive and reproductive performance of *Tenyivo* pig breed of Nagaland: the highest birth weight, weaning weight, age and weight at first matting were 0.58±0.01 kg, 4.78±0.47 kg, 59±0.96 days and 4.55±0.40 kg respectively. Identification and selection of active breeding male can be done at an early age of two to three months of age and the unwanted male sterilized for fattening stock to reduced mortality percentage. *Tenyivo* pig is a small breed with slow growth rate yet the breed is well adapted to the different agro-climatic condition of Nagaland and is more resistant to the common pig diseases. The capacity of this unique breed with the male early sexual maturity as early as 53-60 days of age can help the pig farmers for more piglet production with low input suitable for the marginal and economically weak farmers.

ACKNOWLEGEMENT

The authors duly acknowledge the financial help provided by ICAR-All India coordinator research project on pig, Nagaland Centre, Department of Livestock Production & Management, School of Agricultural Sciences and Rural Development (SASRD), Nagaland University, Medziphema Campus Nagaland for carrying out the present study.

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