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Performance appraisal and conservation need of Doom pig of Assam

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Livestock is an integral component of the farming system in Indian agriculture and it plays a critical role in the welfare of India's rural population by contributing almost 9% to Gross Domestic Product (GDP) (Banik *et al*. 2016a). The majority percentage of the rural households in India depend on livestock farming for supplementary income as it comprises small and marginal farmers and landless households. In countries like India, the majority of people are dependent on agriculture and livestock for their livelihood (Nath *et al*. 2013). Pig rearing is one of the most important occupations of rural society especially the tribal masses of India (Banik *et al*. 2013) specifically in Northeastern regions of India. Assam with an admixture of geographical terrain of hilly and plain state both, pig rearing is ecologically suitable. The state contributes the highest population in India with 2.10 million pigs (20th Livestock census, 2020). People of different tribal communities of Assam rear pigs in backyard smallholder production systems (Banik *et al*. 2020). This not only creates the source of income for the local unemployed youth but also acts as an important source of animal protein requirement for the masses. The increasing demand for animal-source foods in the northeast and India generally, matched with the current low productivity of the northeast pig population, suggests that well-targeted interventions to improve pig production could deliver significant livelihood benefits for tribal and other marginalized groups in the region (Deka *et al*. 2007).

A breed of pig with distinct productive and reproductive characteristics has been identified in the western part of lower Assam adjoining West Bengal. The breed is commonly known as Doom to farmers, researchers, planners and development workers. This pig has been registered as an indigenous pig breed under the National Database with ICAR-National Bureau of Animal Genetic Resources, Karnal with registration number INDIA_PIG_0200_DOOM_09006. The present study was aimed to identify the morphometric as well as (re)productive characteristics and the conservation need of the Doom pig of Assam.

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The breeding tract of Doom pig is mainly distributed in Agomani, Gauripur, Golokganj blocks and Bilasipara sub-division in Dhubri district and a few areas of Bongaigaon and Kokrajhar districts of Assam. The breed is reared in a migratory scavenging system and farmers with flock of Doom pigs are also found in areas of Goalpara and Kamrup districts of Assam.

The latitude and longitude of the breeding tract is 26.0° to 26.6°N and 89.3° to 90.4°E with an approximate area of distribution of about 3,000 km^2. The climate of the area is mildly sub-tropical with warm, dry summers from April to late May, a strong monsoon from June to September and cool, dry winters from late October to March. The area experiences an annual rainfall of 180 cm (from May to September) with an average number of 77.3 rainy days annually. While summer temperature ranges from 22 to 38°C, in winters the temperature ranges from 10 to 25°C. The breeding tract is approximately 30–35 meters above mean sea level (MSL). General topography of the area is plain with patches of small hillocks.

The community responsible for developing and maintaining this breed belongs to a scheduled caste locally known as 'Doom'. It is assumed that the name originated from the name of the community. The people of this community are economically backward and their main livelihood is rearing of these pigs in a group in a scavenging system. They use to migrate with the whole flock in different places in search of food and livelihood within the breeding tract.

In majority of the cases, Doom pigs are kept in a migratory scavenging system of rearing with a flock size of 90–150. The animals are available with the tribal nomadic population of the breeding tract. No specific housing is provided to these animals. While moving from one place to another, animals take shelter under trees.

Doom pig was collected from the breeding tract of the animals for the institute farm of AICRP on Pig Project of Krishi Vigyan Kendra, Goalpara. The physical profile including morphometric characters was recorded. The production and reproduction traits were analyzed using descriptive statistics. The tests of significance for performance of different breeds were analyzed by using

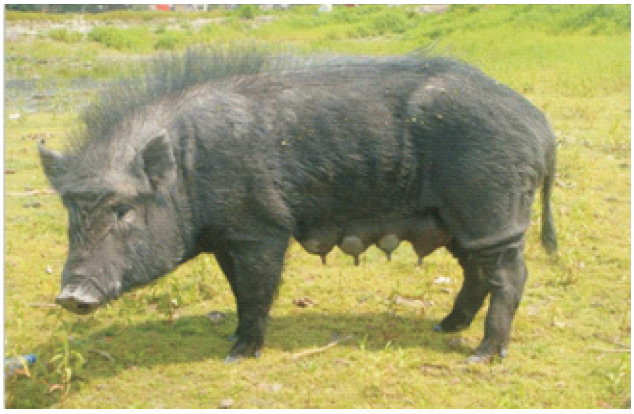

Fig. 1. Adult Doom boar and sow.

analysis of variance (ANOVA) using SPSS (version 10.2).

Doom is a small sized Indian pig breed with a bright active wild look. The colour is predominantly black with long and thick bristles at the backline. Doom pig has a small head, small and erect vertical ears and small and strong forelegs. The snout is tough and slightly concave in size that helping the animals to dig the earth for searching feed while in scavenging system of rearing. Legs are compact and small that helps the animal to travel long distances in the migratory system of rearing. The tail is small and straight in most cases and extended up to the hock joint. Females have 4–5 pairs of teats at the mid ventral line. Females are comparatively bigger than males (Fig. 1). The morphometric measurement of adult Doom pig is given in Table 1.

Table 1. Body measurements (cm) of adult Doom pig

Trait	Male (23)	Female (46)	Total (69)
Chest girth	81.78±0.43^{A}	84.39±0.41^{B}	82.99±0.42
Body length	77.59±0.39^{A}	83.24±0.40^{B}	80.22±0.40
Height at withers	62.19±0.33^{A}	66.19±0.37^{B}	64.55±0.35
Neck girth	66.92±0.39^{A}	70.39±0.40^{B}	68.62±0.39
Tail length	18.92±0.69	19.15±0.66	19.01±0.68
Ear length	9.58±0.31	9.62±0.30	9.60±0.30

Figures in parentheses indicate number of observations.Values with different superscripts along the row indicate significant difference (P<0.05).

Pigs of this breed are generally reared in groups with an average flock size of 120–150. They are kept in migratory system under scavenging conditions. In most of the cases, the flocks migrate from one location to other locations within the breeding tract.

Pigs of both the sexes are ferocious, especially breeding male and nursing sows. The animals are very aggressive to unknown people. Routine farm activities like vaccination, identification, biological sample collection are considerably difficult even under organized farm conditions.

The growth performance is directly indicative of the pork production capacity of the animals. Table 2 represents the growth parameters of Doom pigs at different ages. The mean weight at birth and weaning was observed as 0.66±0.05 and 3.15±0.21 kg which was much lower than other indigenous breeds. Banik *et al*. (2013) reported much higher mean weight at birth and weaning of Ghungroo Pig as 0.96±0.02 and 7.07±0.26 kg, respectively, whereas the respective values for Niang Megha pigs were 0.64±0.02 and 5.47±0.13 kg. Pan *et al.* (2005) reported the average body weight at birth in Ghungroo pigs as 1.08±0.22 kg, reared under field conditions. Similarly, Kumaresan *et al*. (2009) reported the mean weight at birth of the Niang Megha breed as 0.485±0.23 kg and the mean weight at weaning as 4.97±0.21 kg.

Table 2. Body weight (kg) of Doom pig at different intervals

Age in months	Male (kg)	Female (kg)	Average (kg)
At birth	0.64±0.04 (18)	0.68±0.06 (20)	0.66±0.05 (38)
1 month	1.37±0.06 (18)	1.42±0.03 (19)	1.40±0.09 (37)
2 month	3.10±0.09 (17)	3.27±0.12 (19)	3.15±0.21 (36)
3 month	8.16±0.72 (15)	8.85±0.67 (15)	8.42±1.39 (30)
4 month	14.69±0.8 (15)	15.08±.76 (15)	14.89±1.56 (30)
5 month	19.66±0.91 (15)	20.38±.89 (15)	20.04±1.80 (30)
6 month	26.78±1.02 (14)	28.14±1.07 (15)	27.92±2.09 (29)
7 month	33.42±1.71 (10)	35.23±1.85 (10)	34.65±3.56 (20)
8 month	39.85±1.72 (8)	42.63±2.11 (8)	40.48±3.83 (16)
9 month	45.71±2.21 (8)	49.28±2.45 (8)	46.99±4.66 (16)
10 month	53.73±2.83 (5)	54.92±2.61 (5)	54.19±5.44 (10)
11 month	58.25±3.01 (5)	59.66±3.12 (5)	58.99±3.06 (10)
1 year	63.03±3.25 (5)	65.12±3.51 (5)	64.23±3.39 (10)

Figures in the parentheses are the number of observations.

The growth of pigs up to 2 months of age is low. The pre-weaning growth rate of the Doom pigs is 49.77±3.63 gm/day. The post-weaning growth rate up to 10 months of age is 201.13±15.16 gm/day, which subsequently declines to 167.33±12.63 gm/day from the 11th to 12th month of age. The growth curve of Doom pig is given in Fig. 2. Banik *et al*. (2013) reported the average pre-weaning daily gain of 0.11±0.01 and 0.09±0.01 kg, respectively, for Ghungroo and Niang Megha breeds.

Among the reproductive traits, litter size at birth and weaning are most important. The performance of different reproductive traits of Doom pig is enlisted in Table 3.

Carcass traits are one of the major economic traits which

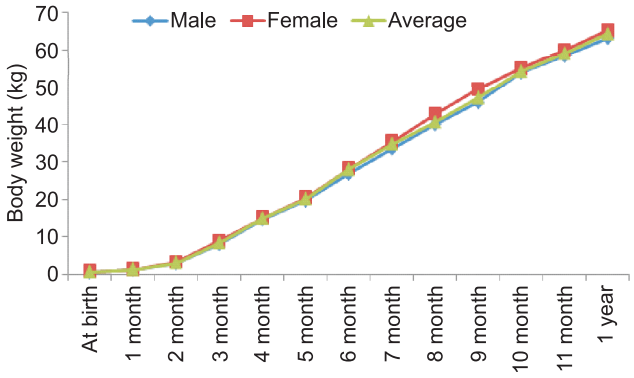

Fig. 2. Growth curve of Doom pig.

Table 3. Reproductive performance of Doom pig

Name of the trait	Mean ± SE	Range
Litter size at birth (no.)	5.92±0.62 (20)	4–7
Litter weight at birth (kg)	3.90±0.32 (20)	2.98–5.10
Individual weight at birth (kg)	0.66±0.05 (16)	0.51–0.78
Litter size at weaning (no.)	4.90±0.33 (20)	3–6
Litter weight at weaning (kg)	14.23±2.12 (20)	10.5–18.0
Individual weight at weaning (kg)	2.92±0.61(22)	2.50–3.75
Age at first heat (days)	202.40±2.20 (5)	190–220
Weight at first heat (kg)	34.13±1.56 (5)	
Estrous cycle duration (days)	21.30±0.65 (7)	19–23
Age at first fertile service (days)	225.65±5.63 (8)	211–240
Age at first farrowing (days)	340.56±6.11 (8)	325–355
Weight at first farrowing (kg)	58.23±4.02 (5)	52–67
Gestation period (days)	113.59±0.33 (5)	112–115
Inter farrowing interval (days)	215.63±7.25 (6)	201–230
Lifetime number of farrowing	3.21±0.29	3–4
Productive life span (months)	36.02±1.23	28–40
Generation interval (days)	415.66±16.23	401–445

Figures in the parentheses are the number of observations.

play an important role in profitable pig farming. Different carcass parameters of Doom pig are listed in Table 4. The animals show higher dressing percentage and primal cut percentage as compared to other indigenous breeds due to its smaller head size. The back fat thickness was observed as 28 mm; which is almost similar to the Ghungroo breed as reported by Thomas *et al*. (2019) (2.73 mm).

Doom pigs can produce very high quality bristle. Both male and female animals have very dense and good quality bristle. Bristles are generally black in colour. An adult male and female can produce 130.20 and 95.10 g of bristle, respectively. The bristle length varies from 8 to 16 cm. The average lengths of bristles in case of male and female animals are 13.74 cm and 10.01 cm, respectively. The average diameter of bristle is 0.46 mm with a range from 0.33 to 0.60 mm. However, in the farmers' field collection and use of bristles are very rare. Mohan *et al.* (2014) reported the average length of bristle of Ghungroo and Niang Mega pigs as 68.6 mm and 127.1 mm, respectively.

An extensive survey on the breeding tract of Doom pig was conducted to identify pure animals and characterize

Table 4. Slaughter and carcass characteristics

Carcass parameter	Mean
Live parameters	
Age at slaughter	8 months
Weight at slaughter	42 kg
Body length	64 cm
Heart girth	71 cm
Carcass parameters	
Dressing percentage	77.54%
Carcass length	48 cm
Back Fat thickness	28 mm
Primal cut percentage	66.80%
Individual cuts	
Loin	5.6 kg
Ham	7.3 kg
Spare rib	3.08 kg
Bacon	3.14 kg
Shoulder	4.72 kg
Butt	4.22 kg
Head	4.51 Kg

the germplasm. This pig has been recently registered as an indigenous pig breed under national database with ICAR-National Bureau of Animal Genetic Resources, Karnal with registration number INDIA_PIG_0200_DOOM_09006. This is the sixth registered pig breed of the country (Banik *et al*. 2016b).

Looking at the importance of conservation of Doom pig, All India Coordinated Research Project on Pig initiated a conservation unit of the breed at Krishi Vigyan Kendra, Goalpara under ICAR-National Research Centre on Pig. The unit is presently having 30 sows of Doom pigs for conservation and selective breeding.

A Government of India sponsored project on conservation of Doom pig was initiated at Livestock Research Station, Mandira under Assam Agricultural University.

Doom pigs are reared by certain tribal communities in their breeding tract in the migratory system of rearing. These animals are mostly dependent on locally available feed resources including household byproducts, tuber crops and roots, bananas and other vegetables. Minimal processing and detoxification of locally available ingredients will increase the nutrient availability and increase the performance of these animals. The breed is mainly reared in a flock of 90–150 by the farmers. Identification of superior germplasm and registration of flock will also be helpful to promote the conservation of the breed in its breeding tract. The provision of incentive and recognition of farmers in the form of awards will increase the enthusiasm of the farmers to rear the animals. Incorporation of scientific pig husbandry practice including vaccination of prevalent diseases, viz. Classical Swine Fever and Foot and Mouth Disease will reduce the major losses of animals during the epidemic and boost the production of Doom pigs at its breeding tract.

SUMMARY

Doom pig is unique indigenous germplasm of Assam which is adaptable to local climatic conditions and thrives with very low to negligible nutritional input and is capable of surviving in a migratory scavenging system, which makes it very popular among local communities of the state for rearing. Looking at the uniqueness and importance of the breed, it has been registered with the National Database of ICAR-National Bureau of Animal Genetic Resources (INDIA_PIG_0200_DOOM_09006). The present study was undertaken to study the breeding tract, rearing practice in the field, evaluate the performance in the organized farm as well as its conservation needs. Formation of breed society, recognition of farmers, educating the stakeholders to use improved packages of practices and provision of incentives to the farmers to rear the animals will be helpful for the improvement of this unique germplasm.

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