Indian Journal of Animal Sciences **90** (10): 1441–1443, October 2020/Short communication

Smallholder pig production system of Assam

SANTANU BANIK[1]✉, SOUMEN NASKAR[2] and KESHAB BARMAN[1]

ICAR-National Research Centre on Pig, Guwahati, Assam 781 131 India

Received: 25 January 2020; Accepted: 29 March 2020

Keywords: Backyard piggery, Pig production characteristics, Pig production constrains, Survey

Livestock is an integral component of farming system in Indian agriculture. It plays a critical role in the welfare of India's rural population by contributing almost nine percent to Gross Domestic Product (GDP) (Banik *et al*. 2016). Pig rearing is one of the most important occupations of rural society especially the tribal masses (Banik *et al*. 2013) specifically in north-eastern regions of India. Assam with an admixture of geographical terrain of hilly and plain state both, pig rearing is ecologically suitable. The state contributes highest population in India with 2.10 million pigs (Provisional statitics, Twentieth Livestock Census, 2020). People of different tribal community of Assam rear pigs in backyard smallholder production system. This not only creates the income generation but also act as a source of animal protein requirement for the masses. Though the tribal dominated areas of the state, pigs are the most important livestock and every household rear pigs in their backyard, but the system of pig rearing is lowly characterized and documented. The production system is basically dominated by prevalence of local non-descript, small-sized animal with smaller litter size and less growth potential. However, smallholder resource-driven pig production system is economically viable and sustainable at household level (Kumaresan *et al*. 2009) with minimal scientific intervention. The present study is carried out to attain information on pig production in smallholder systems such as productivity, the feeding and housing system and reproductive performance.

Among the Districts of Assam, Dhemaji and Tinsukia situated in the eastern sub-Himalayan area were selected for the study due to of high pig population and for being representative of varied management and production system of the region. A stratified purposive and random sampling design was followed for selection of respondents for the study. Information on personal, socio-economic and communication characteristics of farmers along with different backyard pig husbandry practices of the area were obtained through personal interviews by using a questionnaire. Four blocks of each selected districts which include 5–7 villages per block were surveyed. The socio-economic characteristics of farmers and production systems were analyzed using descriptive statistics such as means, frequencies, and percentages. The tests of significance for performance of different breeds were analyzed by using analysis of variance (ANOVA) using SPSS (version 10.2).

A total of 2125 farm families with more than 6400 pigs were surveyed. The perusal of analysis (Table 1) showed that almost 61% respondents were young (up to 35 years).

Table 1. Distribution of socio-economic parameters of farmers responding to questionnaire

Characteristic	Respondents (%)
Age group	
Young (up to 35 years)	60.98
Middle age (35–50 years)	29.56
Old (>50 years)	9.46
Gender	
Male	75.57
Female	34.43
Educational qualification	
Illiterate	24.25
Primary school	21.13
Middle school	23.32
High school	20.18
Higher Secondary	8.66
Graduate	2.46
Family size of farmers	
Small (up to 4 members)	44.79
Medium (5–8 members)	51.14
Large (>8 members)	4.07
Agriculture land holding	
Landless (nil)	15.59
Marginal (up to 2 bigha)	19.87
Small farmers (2 bigha to 1 ha)	52.40
Semi medium (1–2 ha)	10.10
Medium (>2 ha)	2.03
(1 bigha = 14,400 sq feet, 1 ha = 7.5 bigha)	
Annual income	
Up to ₹ 20,000	12.91
₹ 20,000 to 50,000	76.31
₹ 50,000 to 1,00,000	7.83
₹ 1,00,000 and above	2.96

Present address: [1]ICAR-National Research Centre on Pig, Guwahati, Assam. [2]ICAR-Indian Institute of Agricultural Biotechnology, Ranchi, Jharkhand. ✉Corresponding author email: santanubanik2000@yahoo.com

Almost 90% respondents were educated upto secondary level. The annual family income of the respondents was upto ₹ 50000 for almost 90% of the instances. It was also found that, almost 90% farm families were having some contacts with extension personnel including local veterinary officer. The majority of tribal and non-tribal community prevalent in the area belonged to Missing, Boro, Kachari, Deori, Singpho, Kaibarta, Koch, Ahom and Chutia community. People belonging to Schedule Caste and Schedule Tribe community are the main stakeholder of piggery sector in the region. The community prefer to rear pigs due to their high fecundity, high feed conversion efficiency, shorter generation interval and relatively smaller space requirement (Banik *et al.* 2017).

Among the total pig count in the surveyed area, the proportion of piglet, gilt, castrated male, sow and boar were 32.99%, 27.83%, 24.37%, 13.62% and 1.20%, respectively. The Missing tribe, generally rear sows and produce piglets. The pork produced by the Missing community is most often used for rituals and ceremonial purposes. The Deori, Singpho and Kaibarta people keep fattener pigs. Most of the pigs are of local/non-descript type, however in some cases crosses of Large White Yorkshire and Hampshire pigs were also found. Among the local germplasm, Doom and Ghungroo breed were most promising. The crossbreeds are gaining popularity now-a-days because of their better growth rate and good litter size. The blood level inheritance of the crossbred germplasm could not be determined due to indiscriminate crossing of animals in the locality. The farmers prefer to rear crossbreed pigs for better growth performance, higher weight gain, larger litter size and greater back fat thickness which are in conformity with the reports of Rahman *et al*. (2008) in Mizoram and Nath *et al*. (2013) in Sikkim, India. However, the farmers were suggested to keep crossbred pigs from reputed sources, viz. research stations, Government farm.

The intensive pig rearing system was most uncommon (15.21%) in the area due to lack of sufficient knowledge. The pigs are reared under backyard as well as scavenging system. However, scavenging rearing practice is declining. In semi-intensive system, a separate enclosure in made with bamboo nearby dwelling of farmer. Floor is made up of mud. Minimal roofing is provided to the animals made up of tin or thatch. In some cases, the tribal houses are made on a height of 3 feet above the ground and pigs are sheltered on the basement (*Chang Ghar*). In some places, half walled houses made up of bamboo are seen and rarely using bricks and cement.

Pigs were kept by scavenging with supplementation of kitchen and vegetable waste. There was a little similarity of feed offered to the animals by different community; however, most of them manage their pigs with locally available feed ingredients. Along with kitchen wastes, cooked/boiled sweet potatoes, curry leaf, cabbage, *Paederia foetida* (*Bhedai lota*), *Centella asiatica* (*Bor-Maanimuni*), Banana, Drumstick were also used as feed ingredient. The Missing community people generally feeds their pigs with end product of fermented rice beer (*juguli*) and locally available cooked vegetables like cabbage, potatoes, green leafy vegetables. The Deori, Singpho and Kaibarta tribes mainly offers cooked rice with bhusa and banana stem. Bodo people feed their pigs with end product of rice beer

Table 2. Reproduction performances of different genetic group in the surveyed area

Parameter	Ghungroo	Doom	Hampshire-local Cross	LWY-local cross
Litter size at birth	7.85±1.29^{A}	5.51±0.99^{B}	7.74±1.11^{A}	7.65±0.14^{A}
	(6–10)	(3–7)	(6–9)	(6–9)
	(n=76)	(n=65)	(n=72)	(n=68)
Birth wt (kg)	0.31±0.05^{AB}	0.289±0.04^{A}	0.33±0.08^{B}	0.30±0.03^{A}
	(0.20–0.60)	(0.18–0.40)	(0.20–0.50)	(0.25–0.40)
	(n=558)	(n=358)	(n=550)	(n=489)
Weaning wt (kg)	7.86±0.95^{A}	5.54±.90^{B}	7.80±1.00^{A}	7.70±1.02^{A}
	(5–13)	(4–13)	(4–12)	(3.5–9.5)
	(n=476)	(n=315)	(n=482)	(n=412)
2–4month wt (kg)	18.49±2.11^{A}	14.56±2.93^{B}	17.76±2.53^{A}	17.80±2.07^{A}
	(8–36)	(8–25)	(5–32)	(10.5–20)
	(n=416)	(n=276)	(n=408)	(n=395)
5–7 month wt (kg)	32.07±3.50^{A}	29.96±3.54^{B}	31.02±3.14^{A}	32.12±3.52^{A}
	(15–55)	(12–45)	(9–50)	(20–35)
	(n=378)	(n=251)	(n=350)	(n=352)
9–12 month wt (kg)	49.28±4.88^{A}	43.61±5.24^{B}	48.84±4.33^{A}	51.76±6.15^{A}
	(25–85)	(32–45)	(30–75)	(40–80)
	(n=292)	(n=195)	(n=280)	(n=215)
Slaughter wt (kg)	53.16±3.40^{AB}	42.59±6.46^{C}	56.83±7.21^{A}	55.25±8.51^{A}
	(40–70)	(35–55)	(55–68)	(55–65)
	(n=115)	(n=102)	(n=95)	(n=93)

Figures in the parenthesis are range; A, B, Figures with the same superscripts does not differ significantly (P<0.05); n, number of observation.

and rice bhusa. Most of the farmers prefer their pigs to scavenge around for grazing on grass and other plants. It was observed that, none of the farmers provide any concentrate feeds to the pigs. Feeing poultry offals and dry fish as a protein source was also common in few cases. The ingredients are mixed together and boiled before offered to pig. The feeding was mostly based on kitchen waste or locally available low-cost feed ingredients. Similar observation was also made by Rahaman *et al*. (2008) and Nath *et al*. (2013). This practice may lead to nutritionally imbalanced diets (Nath *et al*. 2013) and stunted growth. The farmers were suggested to add mineral mixture and vitamin along with protein ingredients to reduce the deficiency. Due to higher cost and non-availability, no concentrate feed was provided to the pig.

Average age for weaning, litter size at birth, age at first oestrous and age at first furrowing was observed as 1 to 2 months, 4 to 5 numbers, 5 to 6 months and 10 to 11 months, respectively. The body weight of different germplasm is given in Table 2. The animals were apparently healthy and free from major disease incidences. Mortality was negligible; however, a few incidences of pre-weaning mortality were noticed due to lack of care after birth, low milk production of sow and pneumonia. Kumaresan *et al*. (2009) found major causes of disease incidences in pigs as swine fever, mange, digestive disorders, nephritis and respiratory disorders. Vaccination was not practiced in the area. Castration was practiced locally by open method. Some indigenous technical knowledge was applied for general pig health care. These includes, use of *Corchorus olitorius* (*Tita Mora*) leaf and *Cordia dichotomas* (*Buwal*) trees bark for deworming; *Azadirachta indica* (Neem) leaf paste for treatment of lice and mixer of *Murrya koeningi* (*Narahinga*), *Paederia foetida* (*Bhedai lota*), *Piper nigrum* (*Gul Maris*) just after farrowing for killing the microbes and clearing the dirt.

The study revealed the major constrains and opportunity for improvement of the sector. Major constrains include lack of improved germplasm, non-availability of quality breeding boars, high cost of concentrate feed, bio-security issues and lack of operational capital.

SUMMARY

The study was carried out to attain information on smallholder pig production systems of Assam. Stratified purposive and random sampling design was followed for selection of respondents in two districts namely Tinsukia and Dhemaji located in sub-Himalayan terrain. The socio-economic parameter of the farmers were delineated. Mostly the pigs were reared in semi-intensive to loose-house system. Major feed ingredients were kitchen waste and locally available, seasonal unconventional feed. There was prevalence of local breeds namely Ghungroo and Doom pigs along with crossbred animal mostly of Hampshire and Large White Yorkshire crosses. The field level performance was evaluated. The study revealed the major constrains and opportunity for improvement of the sector in the surveyed area.

REFERENCES

Banik S, Naskar S and Gandhi R S. 2017. Swine Genetic Resources of India. Indian Council of Agricultural Research, New Delhi, India (ISBN: 9778171641710).

Banik S, Naskar S, Pankaj P K, Pourouchottamane R, Barman K, Sahoo N R and Tamuli M K. 2013. Construction of growth band for early selection of indigenous pigs in India. *Applied Biological Research* **15**(1): 73–77.

Banik S, Naskar S, Thomas R, Tamuli M K and Sarma D K. 2016. Pig production system in Assam: A sample survey. ICAR-National Research Center on Pig, Guwahati, Assam, India (ISBN 9788193186466).

Provisional Indian Livestock census (Twentieth). 2020. Animal Husbandry Statistics Division, Department of Animal Husbandry Dairying and Fisheries, Ministry of Agriculture, Government of India. Retrieved February, 10, 2020 from http://164.100.117.97/WriteReadData/userfiles/key%20results.pdf.

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* **41**(7): 1187–96.

Nath B G, Pathak P K, Ngachan S V, Tripathi A K and Mohanty A K. 2013. Characterization of smallholder pig production system: productive and reproductive performances of local and crossbred pigs in Sikkim Himalayan region. *Tropical Animal Health and Production* **45**: 1513–18.

Rahman S, Barthakur S and Kalita G. 2008. Pig production and management system in Aizawl District of Mizoram, India. *Livestock Research for Rural Development* **20**(9). Retrieved January, 25, 2020 from http://www.lrrd.org/lrrd20/9/rahm20139.htm.