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Managerial practices of Bareilly *Desi* pigs

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Abstract

Managerial practices in the present context are the tools for increasing production and productivity in piggery sector like other livestock enterprises. The present study was undertaken to document the managerial practices of *Desi* pigs in Bareilly District of Uttar Pradesh in India. Data on management practices of the *Desi* pigs was collected from the respondents through prepared questionnaires and cross questions adjusted to the field conditions. It was found that *desi* pigs were reared mostly by poor and weaker sections of the society with the few exceptions. The *desi* pigs were reared mostly in scavenging system (92.16%) followed by the extensive system which were practiced by a very few pig owners (7.84%). *Desi* pigs were bred mainly through natural mating using any male (97.17%). Most of the *desi* pig farmers followed scavenging (95.57%) and scavenging with supplementation (4.95%) system of feeding. Bareilly *desi* pigs were rarely susceptible to various kinds of diseases. Traditional treatment methods were the most prevalent. It was found that 82.66% of the pig farmers were having poor sanitation whereas only a few (17.34%) farmers were having good sanitation. Majority (79.33%) of the pig farmers sold their pigs in the local market whereas as a few (20.67%) of them sold their pigs to the middle men from their homes. Malnutrition was seen to be the major problem in pig rearing. So, it can be said that awareness programme should be strengthened in the areas of housing, feeding and other management practices for efficient, hygienic and sustainable pig production in the country.

Keywords: *Desi* pig, scavenging, management, sanitation, malnutrition and sustainable

Introduction

Bareilly *Desi* pigs are wild in nature and look, the majority are black in colour and small in size. Legs were white below the hock joint and in some white patches were observed in the forehead and tip of the tail [3]. These *desi* pigs are very much cost effective, available, adaptable, rarely affected by diseases, highly prolific, medium production potential and important genetic resources of the country [3]. In general, these *desi* pigs are kept under traditional management systems characterized by low inputs coupled with poor management conditions. Besides, these pigs are reared mostly under scavenging system in India with a few exception. The observations of *desi* pig management systems are comparable with different managerial systems followed in different regions of the world [5]. The income generated through pig rearing provides insurance against droughts and other natural catastrophes. Good management practices are required to ensure livelihood and the sustainability of the *desi* pig production system. Therefore, the present study was attempted to document the managerial practices of *desi* pigs in Bareilly District to improve their production system and conserve the rich genetic potential of these *desi* pigs for livelihood and sustainable pig husbandry in India.

Materials and Methods

The present investigation was undertaken in six tehsils (namely Bareilly, Nawabganj, Aonla, Faridpur, Baheri and Meerganj) of Bareilly district, Uttar Pradesh, India to document the managerial practices followed by local pigs (*desi* pig) rearers of Bareilly District. Bareilly District is located at 28°10'N Latitude and 78°23'E Longitude and situated at 568 feet above mean sea level. A total of 148 piggery farmers from aforementioned 6 tehsils were selected based on the presence of pig population. Data on managerial practices of the *desi* pigs was collected from July'2015 to Jan'2016 through field suited questionnaires or relevant proforma *i.e.* through prepared questionnaires and cross questions adjusted to the field conditions. These Local pigs are reared in the remote villages of Bareilly under scavenging system, sheltering mostly at night time. They were self-fed on locally available non-conventional fodder plants, also kitchen waste and vegetable waste. Documentation on managerial practices like

rearing system, breeding system, housing system, feeding and watering system, disease prevalence were recorded, based on information provided by the responding farmers through standard questionnaires and then evaluated.

Statistical analysis

The data were analysed to obtain descriptive statistics of various managerial practices of these local pigs followed by the pig rearers of Bareilly District using S.A.S 9.3 software. Chi-square test was also done to see if there is any significance differences in managerial practices adopted by the desi pig farmers amongst the six tehsils of Bareilly district.

Results & Discussions

Presence of any significance differences in managerial practices adopted by the desi pig farmers amongst the six tehsils of Bareilly district were tabulated from Table (1) to Table(4).

Rearing system

In the studied area, the desi pigs of Bareilly district were reared mostly in scavenging system (92.16%) followed by extensive system which were practiced by a very few pig owners (7.84%). No significant differences were observed in rearing system amongst the tehsils. It was found that scavenging system of rearing was the most popular among the pig rearers. In addition, very few pig rearers also practiced girth tethering system where rope is used at chest girth or neck to keep the pig nearby and the ropes were tied to any hard pillar like structure. However, it was reported that in Thailand 80% of the native pig production is based on intensive system of management [17]. Cambodia, Tanzania, Phillipines and Vietnam also use predominantly extensive system for rearing village pigs [5]. The majority of the household (96.9%) reared pig in intensive system [10]. The village pigs in Sri Lanka were found to be reared in either an extensive or a semi-intensive management system or rearing system of which extensive system of rearing was the most common system (77%) [19]. The rearing systems were also different ($P < 0.01$) and the mean figures were 43.4% for free range, 24.5% for tin shed housing, 20.8% for fencing and 11.3% for girth tethering systems [7]. The indigenous pigs in Bangladesh were reared by girth tethering (97%) followed by straw shed housing (2%) and fencing (1%) [18].

Breeding system

In the present study, desi pigs of Bareilly district were bred mainly through natural mating using any male (97.17%) and a very few by proven boar or pedigree males (2.83%). Identification of pig maturity was followed by only 20.05% of the pig rearers. Identification of heat was also followed by a very few pig owners (3.41%). Approximate age at 1st service in female desi pig was found to be 7.28 months. Service at anytime and 3 months after farrowing, practiced by pig rearers were found to be 84.81% and 17.16%, respectively. However, NRC pig, Rani, has started breeding pigs through use of A.I.

Housing system

Duration

Majority of farmers of Bareilly district kept their desi pigs confined during night only (87.7%) and no housing was provided to pigs in 12.30% cases. But, the majority of farmers

kept their pigs confined during night only (54.66%), some farmers kept their pigs confined during both day and night (17.33%) and no housing was provided to pigs in 28% cases [20].

Location

Majority of the desi pig farmers in the Bareilly district housed their pigs side by the house/ or backyard (64.56%), with other animals or separately (25.66%) and down to the house or with themselves (11.055%). Keeping pigs with themselves were noticed in the towns and cities areas where space was the constraint. But, it was reported that Farmers housed their pigs with other animals (36%) and with themselves in their dwelling places (9.33%); 54.66% farmers kept their pigs separately [20]. The majority of the farmers (60.9%) had their pigsties side by the house for easy management [10].

Types of houses

The desi pig farmers in the Bareilly district housed their pigs in kachcha house (80.17%) and 19.83% in partially pucca house. But, it was reported that 52% farmers housed their pigs in kachcha house, 22.66% in pucca and 25.33% in partially pucca house for indigenous pig in West Bengal [20]. Likewise, it was observed that about 98 per cent of the pigs ties were of temporary type and made up of locally available materials [10]. He also mentioned that permanent type of housing was comparatively more in urban areas where the exotic pig rearing was also high.

Housing material

Major housing materials obtained by the pig owners were from locally available materials (88.45%) and only a few farmers used cement as building materials (11.55%). Similarly, it was reported that the housing systems are very simple and are designed only to provide feeding and watering facilities to the animals, minimum fencing and protection from rain, major housing materials are bamboo and jute-stick which are freely available locally [14].

Floor type

In the present study, floor of the pig sty was found to be earthen floor (70.19%), brick finished (21.88%) and cemented floor (10.02%). Similarly, it was reported that floor was found to be earthen floor (57.33%), brick finished (22.66%) and cemented floor (20%) [20]. The floor of the sty was made up of wooden planks with a gap of 1 – 2 inch in between them so that the excreta directly fall down on the ground and not accumulated under the sty thus preventing health hazards to the pigs [10].

Roofing pattern

The roofing pattern followed by the desi pig farmers of the Bareilly district were open roof (18.33%), half covered roof (60.20%) and fully covered roof (21.21%). Similarly, it was mentioned that roofing pattern was found to be covered (25.33%), half covered (62.66%) and open (12%) [20]. The roofing materials comprised of bamboo, tin, thatch, polythene, hard boards etc. [10]

Wall

The wall of the desi pigs sties in the Bareilly district were half wall (70.47%), full wall (21.40%) and no wall (7.51%). The walls of the sties were made up of wood or bamboo with wooden log pillars [10].

Feeding and watering system

System of feeding

In the present study, most of the desi pig farmers followed scavenging (95.57%) and scavenging with supplementation (4.95%) system of feeding. But, it was reported that the farmers managed their Ghungroo pigs in both under stall-feeding and stall-feeding-cum-grazing systems and also tethered grazing is the usual practice^[14]. The present findings were in accordance with other researcher who reported that scavenging was the common method (60%) of feeding under extensive management system in most of the areas^[19]. However, it was reported that 65.33% of pig farmers used to rear pigs by tethering which has made possible of keeping pigs out-of-doors and at the same time on a limited area^[20]. Grazing without tethering was found to be 34.66%. Moreover, it was also reported that the system of feeding was significantly ($P < 0.05$) higher, since percentage of farmers (96.9%) practiced stall-feeding whereas only a very few farmers (3.2%) allowed their pigs for scavenging^[10].

Feeds

The desi pig farmers of Bareilly district used locally available feeds and fodder viz. Kitchen waste (68.88%), Vegetable waste (17.18%) and both (9.48%). It was reported that swill, rice polish and coconut poonac were the main components of pig feeds in most of the areas^[19]. There was no provision for concentrate supplementation in family level pig farming^[18]. The use of hotel waste in periurban region of Haryana is an useful practice^[15]. Farmers of Assam, Mizoram, and Nagaland boiled the feeds before giving to pigs^[11]. It was also reported that all the farmers followed stall feeding and supplied kitchen waste with certain weeds, after boiling, to their pigs while only half (50%) of them offered concentrate feeds (maximum 1kg per pig)^[16]. Pigs prefer their feed wet, so adding water or surplus goat's milk to their feed will be appreciated^[6]. The plants, collected from forest and adjoining areas were cut into small pieces, mixed with kitchen waste, crop residues, cooked to boiling and fed to the pigs^[10]. However, it was also focused that majority of the farmers offered no feed supplements to their pigs^[10]. Pigs must also have adequate supply of drinking water daily, about two to four gallons^[1, 2, 6, 13, 21]. Potatoes, carrots and other fruit and vegetables can also be fed^[21]. The amount of feed depends on the age and the reproductive state of the pig.

Frequency of feeding

Majority (82.58%) of farmers provide feeds once a day and a few farmers (16.49%) provide feeds to their pigs sometimes or occasionally. Pigs were fed twice daily, morning and evening^[16]. Pigs are normally fed twice a day^[21].

Feeding and watering implements

Most (70.25%) of the farmers used wooden feeding and watering implements followed by stones (12.11%), cemented (11.03%) and tiles (5.54%). Water may be provided through a tub or automatic nipple waterer^[1, 2, 6, 13, 18, 21] mentioned that in some households, traditional pig feeder (Ringkhong) was used to feed pigs. The majority of farmers (98.1%) used local feeders, made up of wooden planks, for feeding pigs^[10]. It was also mentioned that other materials used as feeder/waterer were cut tyres of vehicles and aluminium plates^[10].

Source of drinking water

In the present study, the main source of drinking water for the

desi pigs was tube well (75.50%) followed by well (11.58%), ponds (9.38%) and streams (4.46%). Tube-well or natural reservoir was the source of water for pigs^[18]. It was reported that pond water as the source of water for pigs was found to be very common (52%) and in only 33.33% cases farmers used well water and 14.66% tube well water^[20].

Health & Vaccination

In the present study, pig farmers reported that desi pigs seldom suffer from diseases with a few exceptions. A very few (1.18%) pig farmers went for treatment of their diseased pigs whereas most (98.82%) of the farmers did not. No vaccination was followed by the pig owners in the studied area. It was reported that only 37.8 per cent vaccinated their pigs against swine fever^[10]. Several farmers practiced local treatment for the ailing pigs (e.g applying turmeric on the wound, feeding some plants for deworming the pigs etc). Farmers got their pig vaccinated (82%) against swine fever^[16]. It was reported that a total of 8.5% people used vaccine against hemorrhagic septicemia, anthrax, foot and mouth disease and others^[18].

Deworming of desi pigs were seldom done by pig owners except feeding of some traditional deworming herbs and plants that were known to them since their forefathers. It was reported that deworming of pigs was done by 40% people and sometimes people used to feed pig tea waste, crabs, and some sour fruits like tamarind or chalta for deworming purpose^[18]. Deworming of pigs were done by feeding some plants, herbs, etc.^[10] Most of the farmers (64%) followed deworming using either traditional or allopathic medicine^[16].

Cleaning

Most (76.73%) of the pig farmers did not clean their pig sties daily whereas only a few (22.75%) farmers did clean their pig sties daily or more often. Cleaning of pigsty was done once in a week by 65 percent of the farmers^[16]. It was mentioned that frequent washing of pigsty is very much essential for maintaining the pig in good health, it was observed that no farmer washed the pigsty daily^[10].

Sanitation

Based on the cleanliness and frequency of cleaning sanitation of the pig sties were judged as good or poor. It was found that 82.66% of the pig farmers were having poor sanitation whereas only a few (17.34%) farmers were having good sanitation. The management conditions were found to be moderate (good sanitation and shade with inadequate level of feed) in general under extensive system^[19]. The sanitary condition of 7.5% pig owners was good but the rest 97.5% was poor in Bangladesh^[18]. Proper ventilation is required to remove ammonia (NH₃), methane (CH₄) and hydrogen sulfide (H₂S) gases^[8, 9, 12].

Marketing of desi pigs

Majority (79.33%) of the pig farmers sold their pigs in the local market whereas as a few (20.67%) of them sold their pigs to the middle men from their homes. Pig had comparatively good marketing demand at those areas. It was reported that most of the market side was home and road side hut^[18]. Majority (88.41%) of the pig farmers marketed their pigs in the local market in the form of live whereas as a few (11.59%) of them sold their pigs in the form of pork and bristles too. The average age of marketing of desi pigs was found to be as 10.89±0.36 months and 13.50±0.50 months,

respectively. The average cost of per kg desi pork in the studied area was Rs. 130.83±3.43. Pigs were marketed at the age of 1 year or above when they attained body weight of 90 kg or more and the market price of pork was Rs. 120 [16]. It

was mentioned that the market price of each piglet was 1000–1500 BDT at the studied areas. The price of an adult pig ranged from 15,000 to 20,000 BDT [18].

Table 1: Managemental practices followed by the farmers of Bareilly district (%) (n=No. of Farmers)

Managemental practices	Parameters	Predefined Answers	Bareilly (n=30)	Nawabganj (n=32)	Aonla (n=34)	Faridpur (n=16)	Baheri (n=18)	Meerganj (n=18)	Overall %	χ ²	
System of rearing	Scavenging	Scavenging	96.67 (29)	96.88(31)	82.35(28)	93.75(15)	88.89(16)	94.44(17)	92.16	6.586	
	Extenssive	Extenssive	3.33 (01)	3.13 (01)	17.65(06)	6.25 (01)	11.11(02)	5.56(01)	7.84		
Breeding system	Natural Service(N)	Any Male	96.67(29)	96.88 (31)	97.06 (31)	93.75 (15)	94.44 (17)	94.44 (17)	97.17	1.576	
	100%	pedigree male	3.33(01)	3.13(01)	2.94(01)	6.25 (01)	5.56(01)	5.56 (01)	2.83		
	Identification of pig maturity	YES	YES	3.33 (01)	3.12 (01)	5.88 (02)	6.25 (1)	5.56 (01)	5.56 (01)	20.05	124.472**
		NO	NO	96.67 (29)	96.88 (31)	94.12 (32)	93.75 (15)	94.44(17)	94.44(17)	96.45	
	Idn of Heat	YES	YES	3.33(01)	3.12 (01)	3.50 (01)	6.25 (1)	5.56 (01)	5.56 (01)	3.41	133.095**
		NO	NO	96.67(29)	96.88 (31)	96.50(33)	93.75 (15)	94.44(17)	94.44(17)	96.59	
	Approx age at 1st service	<8M	<8M	7.33±	7.50	7.17	7.33	6.83	7.50	7.28	5.427
		>8M	>8M	9.33	9.00	11.00	11.00	10.50	10.00	10.14	
Service after farrowing	Any time after farrowing (m) After 3 M	Any time after farrowing (m) After 3 M	93.33(28)	81.25 (26)	79.41(27)	93.75(15)	83.33 (15)	77.78 (14)	84.81	17.16	

N.B: n=No. of Farmers, P<0.001(***), P<0.01(**), P<0.05(*)

Table 2: Housing System followed by the farmers of Bareilly district (%)

Housing system %	Particulars	Bareilly (n=30)	Nawabganj (n=32)	Aonla (n=34)	Faridpur (n=16)	Baheri (n=18)	Meerganj (n=18)	Overall	χ ²
Duration	Night only	93.33 (28)	87.50 (28)	79.41(27)	93.75 (15)	94.44(17)	77.78 (14)	87.70	50**
	No housing	6.67 (02)	12.50 (04)	20.59 (07)	6.25 (01)	5.56 (01)	22.22 (04)	12.30	
Location	separately /with other animal	26.67 (08)	20.63(20)	32.35 (23)	18.75 (11)	33.33 (13)	22.22 (15)	25.66	50*
	Side by Backyard the house/	66.67 (20)	67.59(08)	55.88 (07)	75.00 (05)	55.56 (03)	66.67 (02)	64.56	
	Down to the house/with human	6.67 (02)	13.13(04)	11.76 (04)	12.50 (02)	11.11(02)	11.11(01)	11.05	
Type of houses	Kachha	86.67 (26)	84.38 (27)	79.41 (27)	75.00 (12)	72.22 (13)	83.33 (15)	80.17	2.264
	Partially pucca	13.33 (04)	15.63 (05)	20.59 (07)	25.00 (04)	27.78 (05)	16.67 (03)	19.83	
Housing material Floor	Locally avail mat.	93.33 (28)	81.25 (26)	85.29(29)	87.50(14)	94.44(17)	88.89 (16)	88.45	3.110
	Cement	6.67 (02)	18.75 (06)	14.71(05)	12.50 (02)	5.56 (01)	11.11 (02)	11.55	
	Earthen	66.67 (20)	62.50 (20)	67.65 (23)	68.75 (11)	72.22 (13)	83.33 (15)	70.19	
	Brick finished	26.67 (08)	25.00 (08)	20.59 (07)	31.25 (05)	16.67 (03)	11.11(02)	21.88	
Roofing pattern	Cemented	6.67 (02)	12.50 (04)	11.76 (04)	12.50 (02)	11.11(02)	5.56 (01)	10.02	50*
	open	13.33 (04)	18.75 (06)	14.71 (05)	18.75 (03)	22.22 (04)	22.22 (04)	18.33	
	half covered	60.00 (18)	54.69 (18)	61.76(21)	62.50 (10)	61.11 (11)	61.11(11)	60.20	
Wall	fully covered	26.67 (08)	25.00 (08)	23.53 (08)	18.75 (03)	16.67(03)	16.67(03)	21.21	50*
	half wall	66.67 (20)	68.75 (22)	73.53 (25)	75.00 (12)	61.11 (11)	77.78 (14)	70.47	
	full wall	23.33 (07)	21.88 (07)	20.59 (07)	18.75 (03)	27.78 (05)	16.67(03)	21.50	
	NO wall	10.00 (03)	6.25 (02)	5.88 (02)	6.25 (01)	11.11 (02)	5.56 (01)	7.51	

N.B: n=no. of farmers P<.001(***), P<.01(**), P<.05(*)

Table 3: Feeding systems followed by the farmers of Bareilly district (%)

Feeding system %	Particulars	Bareilly (n=30)	Nawabganj (n=32)	Aonla (n=34)	Faridpur (n=16)	Baheri (n=18)	Meerganj (n=18)	Overall	χ ²
System of feeding	Scavenging	96.67 (29)	96.87 (31)	94.12 (32)	93.75 (15)	94.44(17)	94.44 (17)	95.57	0.582
	Scavenging with supplementation	3.33 (01)	3.13 (01)	5.88(02)	6.25 (01)	5.56 (01)	5.56 (01)	4.95	
Feeds	Kitchen waste(KW)	66.67(20)	62.50(20)	76.47(26)	68.75(11)	83.33(15)	55.56(10)	68.88	25
(Locally available)	Veg. waste(VW)	20.00(3)	21.88(7)	14.71(5)	18.75(3)	5.56(1)	22.22(4)	17.18	
	Both (B)	10.00(6)	12.50(4)	5.88(2)	6.25(1)	5.56(1)	16.67(3)	9.48	
	bran & others	3.33(1)	3.13(1)	2.94(1)	6.25(1)	5.56(1)	5.56(1)	4.46	
Frequency of feeding/day	Once(O)	96.67(29)	93.75(30)	91.18(31)	75.00(12)	55.56(11)	83.33(15)	82.58	50**
	sometimes	3.33(1)	6.25(2)	8.82(3)	25.00(4)	38.89(8)	16.67(3)	16.49	
Feeding and watering	Wooden	66.67(20)	56.25(18)	61.76(20)	81.25(13)	83.33(15)	72.22(13)	70.25	25
	Tiles	6.67(2)	6.25(2)	2.94(1)	6.25(1)	5.56(1)	5.56(1)	5.54	
Implements	Stones	13.33(4)	18.75(6)	17.65(6)	6.25(1)	5.56(1)	11.11(2)	12.11	25
	Cemented	10.00(3)	15.63(5)	17.65(6)	6.25(1)	5.56(1)	11.11(2)	11.03	
Source of drinking water	pond(P)	6.67(2)	9.38(3)	11.76(4)	6.25(1)	16.67(3)	5.56(1)	9.38	25
	well(W)	10.00(3)	9.38(3)	14.71(5)	18.75(3)	5.56(1)	11.11(2)	11.58	
	tube well(TW)	80.00(24)	78.13(25)	70.59(24)	68.75(11)	77.78(14)	77.78(14)	75.50	
	Stream(S)	3.33(1)	3.13(1)	2.94(1)	6.25(1)	5.56(1)	5.56(1)	4.46	

Table 4: Health and Sanitation (%)

Health and % sanitation	Particulars	Bareilly (n=30)	Nawabganj (n=32)	Aonla (n=34)	Faridpur (n=16)	Baheri (n=18)	Meerganj (n=18)	Overall	χ^2
Diseases	Yes	10.00(3)	18.75(6)	11.76(4)	6.25(1)	16.67(3)	11.11 (2)	10.57	17.732*
	No	90.00(27)	81.25(26)	88.24(30)	93.75(15)	(15)	89.89 (16)	89.43	
Cleaning	YES	10.00(3)	18.75(6)	26.47(9)	31.25(5)	22.22(4)	27.78(5)	22.75	4.216
	NO	90.00(27)	78.13(25)	73.53(25)	68.75(11)	77.78(14)	72.22(13)	76.73	
Sanitation	GOOD	10.00(3)	12.50(4)	17.65(6)	25.00(4)	16.67(3)	22.22(4)	17.34	2.619
	POOR	90.00(27)	87.50(28)	82.35(28)	75.00(12)	83.33(15)	77.78 (14)	82.66	

N.B: n=no. of farmers, $P < 0.001$ ***, $P < 0.01$ ** , $P < 0.05$ (*)

Conclusion

Bareilly desi pigs are highly prolific, disease resistant, medium production potential and important genetic resources of the country. They are very less susceptible to various kinds of diseases. Pig had comparatively good marketing demand at those areas. *Desi* pigs of Bareilly District have the immense potential to be developed in order to contribute livelihood and sustainable pig farming in the country. These *Desi* pigs serve as a valuable source of nutrition and secondary income source to the piggery farmers. Their adaptability to harsh climatic and managerial conditions and requirement of low input and makes these precious *Desi* pigs farming a best enterprise. In the present scenario, the desi pig breeds are on the verge of extinction. So, its multiplication has to be taken care off through proper breeding strategies. Malnutrition seemed to be the major problem in pig rearing. From this study, it can be said that awareness programme should be strengthened in light of managerial practices, which is essential for scientific pig production management.

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