



Epizootics Associated in Ghongroo Pig Mortality in an Organized Farm Under Hot and Humid Climatic Conditions in West Bengal, India

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Abstract

Ghungroo pig are larger native breed of pig that are distributed in west Bengal particularly in tarai and duars region of Himalayan regions of West Bengal of Darjiling, Jalpaiguri and Coochbihar districts. The animal being native to West Bengal is reared easily in household and farm conditions with effective productivity. The breed is now disseminated amongst the farmers of plain areas though Animal Science University and Indian Veterinary Research Institute, Kolkata. Scientific productivity of this pig found well acclimatized in the plain land and humid condition. Disease prevalence, morbidity, and mortality of this breed not much reported. In Eastern Regional Station, IVRI, Kalyani Farm a sizable numbers of pigs are maintained under AICRP Pig, where morbidity and causes of mortality database documented. More than five years (June, 2017 to October 2022) of mortality has been analysed based on causes of disease deaths. A total of 294 deaths were recorded of monthwise population of 5680 corresponding to 5.17% mortality. Age wise highest mortality recorded in piglets followed by weaners and adults corresponding to 8.407, 5.09 and 1.425% respectively. Mortality in males (7.364% is higher than females (3.7645%). Highest mortality estimated in May (8.043%) and least in October (2.089%). The causes of mortality were wide with 27 diseases and conditions namely abortion, asphyxia, anaemia, bloat/tympany, cardiac failure, crushing, cystitis, debility, dehydration, enteritis, encephalitis, erysipellosis, hypoglycemia, impaction, indigestion, inanition, heat stress, hepatitis, hernia, meningitis, nephritis, pneumonia, pyometra, septicemia, shock and wound complication. High mortality above 5% with pneumonia, crushing hypoglycemia, debility, inanition, and enteritis corresponding to 14.3, 12.6, 12.6, 7.14, 6.12 and 5.78% respectively.

Keywords: Diseases; Epizootic; Ghongroo; Mortality; Swine

Introduction

In India, there are several breed of swine are distributed in different states in India particularly in East and North Eastern States. The prominent breeds are Ghungroo, Purnea, Ghurrah, Doom, Niang Megha, Mali, Zovawk, Agonda Goan, Tenyi Vo, and Nicobari. This indigenous Ghungroo pigs are distributed in North Bengal particularly in Himalayan tarai and Duars regions and also in Nepal adjacent places of Darjiling district of West Bengal. The black-coloured pig sometimes having white stripes around neck and shoulder upto hind legs and the face is like "bull dog" appearance with shortened corrugated snout. It can sustain in the farmers house with minimum inputs, wide climatic condition and health care [1]. It may provide 6-14 piglet weighing 0.5 to 1 kg body weight and at weaning 7-10 kg. They are mostly docile and are easy to handle the

production performance in this breed of indigenous pigs is higher than other indigenous pigs in India. The body weight gain at 6 and 9 months may be 35 and 45 kgs respectively [2]. The Ghungroo pig can be comparable with large white yorkshire in India for its better production performance and meat quality [4]. The mortality in pigs is proportional with the application modern inputs for high productivity and growth. Several risk factors may be responsible to invite diseases and infection for the high yielding animals in farm condition. In ghungroo the prevalence of diseases due to risk factors is comparatively less than the exotic and Cross bred animals [10]. However, there is scanty data about different disease death among the Ghungroo population. The climatic condition in farm area (Longitude-88.433721, Latitude-22.9747271) has wide

range of weather parameters such temperature 13-33°C, rainy days 138, annual rainfall 1250mm, humidity 60-98%. The Present study was under taken to find out the prevalence of disease deaths in this animals in different months, season and age groups based on Autopsy findings as well as clinical findings during treatment of animals.

Materials and Methods

Necropsy

A local pig Ghongroo breeds is maintains at the well-organized Government farm at Eastern Regional Station, Indian Veterinary Research Institute at Kalyani farm. The study was conducted from June 17, 2017, to October 31, 2022. The pigs are maintained in separate pens as per age (piglets, weaners and adults) and sexes. The animals are fed with balance feeds as per their age and health care as well vaccination of Classical swine fever and FMD are done to check outbreak. The daily deaths are necropsied just after death upto 8 hours. The confirmation of death are ascertained by clinical signs and pathological lesions noted during clinical study and post necropsy lesions are noted in the post mortem register as per standard protocol [3,13].

Data base

Death of pigs and population was considered month wise. Five years study with the total population of pig was sum up 5680 and the total mortality was 294 irrespective of age, sex and months. The mortality data base is maintained at the Kalyani Farm of Regional Station of Indian Veterinary Research Institute. All the necropsy report and population data are maintained in the post mortem register, stock register and other register as well as in computer. Age wise the pigs were divided into piglet, grower and adult. Upto 9 weeks considered piglet, ten weeks to 25 weeks are weaner and above 25 weeks considered adult pigs. Mortality was also considered in 12 different months of the year, in different age, sex, and months with standard procedure [6,8].

All the pigs were reared under standard feed with the balance ration provided to them. The feed contains in strater feed, grower feed and finishers feed. The crude protein of the different groups of pigs were 20.05, 17.95, 16.10 %, either extract 2.10, 1.98 and 2.0% , crude fibre 4.25, 4.55 and 6.52% and acid insoluble ash 3.5, 3.6 and 3.75, moisture content 8, 7-9 and 10% along with supplementation of calcium, phosphorus, lysine, methionine, trace minerals and vitamins, standard health management practice and intensive

shelter management practice. The diseases reported during necropsy study are maintained in post mortem database in register and soft copies in computer.

Statistical analysis

Chi square test of goodness of fit was employed to see whether there is any significant difference in the rate of mortality among the age, sex, months, season and diseases of different system involvement. The data generated was statistically analyzed as described [14].

Result and Discussion

The average mortality of the swine population was 5.17% where the month wise total population of the period was 5680. The mortality in piglets, weaner and adult population were 8.407, 5.090 and 1.425% respectively. Mortality was higher in piglets at pre-weaning stage (8.40%) than weaned piglets (5.09%) and adult pigs (1.42%) but these differences were not statistically significant ($X^2 = 4.73$, $p = 0.09$). Piglets after birth face several infectious and noninfectious causes of etiologies for disease occurrence, the weaner who get some immunity and body make up after crossing the piglet life while in adult stage immunization programme and natural immunity keep them healthy than the piglets and weaner stages [5,15] Month wise highest mortality estimated in May (8.043%) and least in October (2.089%) while mortality more than 5% remained for 7 months (Table 1, Figure 1, 2). There was slight variation in the rate of mortality among the seasons (Winter = 4.96%, summer = 6.75% and Monsoon = 3.86%). But these differences were not statistically significant ($X^2 = 0.81$, $p = 0.66$). There was no significant difference in the rate of mortality among the months ($X^2 = 5.861$, $p = 0.882$). Minor differences in mortality in different seasons and months may be changed based on environmental factors such as humidity, temperature, rainfall, air flow, sun exposure hours etc. The mortality of male pigs and female pigs was not significantly different ($X^2 = 1.31$, $p = 0.25$). A total of 164 (2.88%) males and 130 (2.28%) females were died during this period. However, population-based mortality in males remained 7.364% and in females it was 3.765%. Year wise mortality found to be varied, the mortality trends in different years has been increasing except in the year of 2020. It has been also seen that increasing population may be responsible higher mortality increasing (Table 2, Figure 2). Similar variation in pig mortality in different months, age, sexes and year variation also reported by various researchers [5,6].

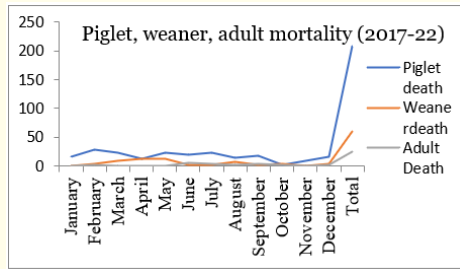


Figure 1: Diagram month wise mortality in piglet, weaner and adult.

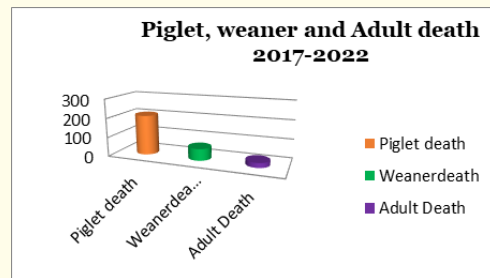


Figure 2: Bar diagram of mortality age wise.

Months	Piglet			Weaner			Adult			Mortality
	Death	Population	Mortality	Death	Population	Mortality	Death	Population	Mortality	
January	16	208	7.692	1	52	1.923	0	171	0	3.944
February	29	282	10.28	3	86	3.488	2	176	1.136	6.25
March	24	267	8.989	9	81	11.11	0	178	0	6.274
April	13	225	5.778	11	85	12.94	3	173	1.734	5.59
May	23	191	12.04	10	110	9.091	4	159	2.516	8.043
June	19	175	10.86	2	110	1.818	6	162	3.704	6.04
July	24	229	10.48	2	128	1.563	4	145	2.759	5.976
August	14	242	5.785	7	145	4.828	2	204	0.98	3.892
September	18	245	7.347	2	111	1.802	4	189	2.116	4.404
October	2	121	1.653	4	75	5.333	2	187	1.07	2.089
November	9	108	8.333	1	69	1.449	1	187	0.535	3.022
December	17	181	9.392	4	48	5.091	2	175	1.143	5.693
Total	208	2474	8.407	56	1100	5.091	30	2106	1.425	5.176

Table 1: Month and age wise Mortality pig (2017-2022).

Months	Male pigs			Female pigs		
	Death	Population	Mortality	Death	Population	Mortality
January	9	177	5.085	9	254	3.543
February	16	202	7.921	19	315	6.032
March	13	191	6.806	20	325	6.154
April	16	167	9.581	12	300	4.000
May	30	180	16.67	9	271	3.321
June	19	201	9.453	11	290	3.793
July	16	230	6.957	13	320	4.063
August	12	234	5.128	10	330	3.03
September	13	227	5.727	7	340	2.059
October	4	133	3.008	4	230	1.739
November	3	144	2.083	6	235	2.553
December	13	141	9.22	10	243	4.115
Total	164	2227	7.364	130	3453	3.765

Table 2: Sex wise mortality (2017-2022).

The causes of mortality were grouped roughly based on the system involved as gastrointestinal, cardiovascular, musculoskeletal and skin, urogenital, respiratory, nervous, and unknown (lesion obscured). The observed mortality rates were gastrointestinal (1.84%), cardiovascular (0.51%), musculoskeletal and skin (1.14%), urogenital (0.22%), respiratory (0.80%), nervous (0.05%), and unknown or lesion obscured (0.58%). The differences among the mortality rates due to different causes were not significant ($X^2 = 2.98, p = 0.81$).

Interestingly, there was a significant ($X^2 = 17.14, p = 0.029$) association of cause of death and season. The proportion of death within causes and seasons is presented in table 3 and 4.

Mortality in pig population found with various infectious and noninfectious causes. A wide range of diseases/conditions have been identified as cause of deaths. The noninfectious causes of deaths are anaemia, bloat, crushing, hypoglycemia, impaction, in-

digestion, inanition, heat stress etc. The infectious causes of deaths are erysipellosis, abortion, enteritis, pneumonia, septicemia, pyometra etc. Highest death recorded with pneumonia 14.3% (42), followed by crushing (12.6%), hypoglycemia (12.6%), debility (7.14%), inanition (6.12%), enteritis (5.78%), septicemia (4.76%), hepatitis (3.74%), bloat, cardiac failure and indigestion (3.4%) and Cystitis (2.04%). Several other minor etiologies have also been reported including asphyxia, dehydration, encephalitis, heat stress, hernia, meningitis, nephritis, shock, wound complications (Table 4). Season wise highest death recorded in summer months (Table 3) March to June (124, 6.471%) while the mortality in monsoon season (July to October, was (85, 4.205%) and winter November to February (85, 4.876%). Pig is an animal whose fat coverage over skin is high, this fatty skin acts as insulator for heat dissipation and cause heat stress during summer and the mortality increased due to heat stress related immune status and related metabolic diseases, lactation, production, metabolic disorders [7,12]. During winter months also there is cold exposure also acts stress particularly amongst low age group of animals that is why the death more in

Season	Death	Population	Mortality
Summer (March-June)	124	1916	6.471
Rainy (July-October)	85	2021	4.205
Winter (November-December)	85	1743	4.876
Total	294	5680	5.176

Table 3: Season wise pig mortality.

Organ	Disease	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total	%
Gastrointestinal system	Bloat		2			2	1	1		1		1	2	10	3.4
	Enteritis		2	1	1	6	3	2					2	17	5.78
	Hypoglycemia	3	9	7	1	1	1	4	2	5	1	1	2	37	12.6
	Impaction						2							2	0.68
	Indigestion	2	7	1										10	3.4
	Inanition	1	3	1	3		1	2	5		2			18	6.12
	Hepatitis	1		3	1	2	1	1	1				1	11	3.74
		7	23	13	6	11	9	10	8	6	3	2	7	105	1.85
Cardiovascular System	Anaemia					1								1	0.34
	Cardiac failure	3	1			3		1		1			1	10	3.4
	Dehydration		1							1	1			3	1.02
	Septicemia	2	1	1	1		3	1	1	2		2		14	4.76
	Shock								1					1	0.34
		5	3	1	1	4	3	2	2	4	1	2	1	29	0.51

Musculoskeletal and skin	Crushing	4	1	6	1	5	2	5			3	3	7	37	12.6
	Debility		1	6	6		2	3		2			1	21	7.14
	Erysipellosis			1										1	0.34
	Hernia				2	2								4	1.36
	Wound						2							2	0.68
		4	2	13	9	7	6	8		2	3	3	8	65	1.15
Urinogenital	Abortion	1												1	0.34
	Cystitis		3						1	2				6	2.04
	Nephritis			2	1	1		1						5	1.7
	Pyometra							1						1	0.34
		1	3	2	1	1		2	1	2				13	0.23
Respiratory	Asphyxia								1				1	2	0.68
	Heatstress					2								2	0.68
	Pneumonia		2	2	4	3	4	7	8	5	1	3	3	42	14.3
		2	2	4	5	4	7	9	5	1	3	4	46	0.81	
Nervous	Encephalitis								1					1	0.34
	Meningitis			1							1			2	0.68
				1				1			1			3	0.05
	Lesionobscure		1	1	6	9	5	1	2	5			3	33	0.58
Total		17	34	33	27	37	27	30	23	24	8	11	23	294	5.17

Table 4: System wise disease prevalence in pigs Table- System wise disease prevalence in pigs.

comparison to rainy seasons the least mortality season [9,11,16].

Conclusion and Perspective

Ghongroo is a big sized pigs are reared in Tarai and Duars are of sub-Himalayan region of West bengal is not very prone to different diseases which occurs in exotic breeds of pig, however they are affected with some diseases like abortion, asphyxia, anaemia, bloat/tympany, cardiac failure, crushing, cystitis, debility, dehydration, enteritis, encephalitis, erysipellosis, hypoglycemia, impaction, indigestion, inanition, heatstress, hepatitis, hernia, meningitis, nephritis, pneumonia, pyometra, septicemia, shock and wound complication. The average mortality with different diseases estimated to be 5.17%. High mortality recorded in piglet but least in adult population. The morbidity and mortality can be restricted if the proper checking of risk factors such as weather parameters, nutritional stress, shelter management fault etc. are considered properly. Once mortality may be restricted to a minimum figure the eco-

nomie growth through productivity will increase.

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