

**Pre-weaning piglet mortality of different genetic groups of pig at KVK operating villages of Assam**D. Deka<sup>1</sup> • D. Kalita<sup>1</sup> • R.N. Goswami<sup>1</sup> • Arundhati Phookan<sup>1\*</sup> • N. Deka<sup>2</sup><sup>1</sup>Department of Animal Genetics and Breeding, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-781022<sup>2</sup> ICAR-AICRP on Pig, Assam Agricultural University, Khanapara, Guwahati-781022ARTICLE INFOABSTRACT**Article history:**

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Records pertaining to 286 litters of HD-K75, HD-K75 X Ghoongroo and Ghoongroo pigs maintained at private farms of Krishi Vigyan Kendra (KVK), Baksa operating villages of Baska district of Assam were utilized to carry out a study on pre-weaning piglet mortality. Data were classified into three genetic groups (HD-K75, HD-K75 X Ghoongroo and Ghoongroo), four parities of dam, three systems of rearing (intensive, semi-intensive and tethering) and four seasons of farrowing (Pre-monsoon, Monsoon, Post-monsoon and Winter). The overall least-squares mean of pre-weaning piglet mortality (%) was found to be  $23.001 \pm 0.603$ . The analysis of variance revealed that genetic group, parity of dam and season of farrowing had no significant effect on pre-weaning mortality, whereas system of rearing had highly significant effect ( $P < 0.01$ ) on pre-weaning piglet mortality. Marginally higher mortality percentage was noticed in Ghoongroo pigs, in piglets born to 3<sup>rd</sup> parity and in winter season. Significantly higher mortality was noticed in piglets reared in tethering system.

**1. Introduction**

The profitability of pig farm largely depends upon the piglet mortality up to weaning, besides closely related factors such as litter size and litter weight at birth. Piglet mortality is an important economic trait which has great bearing on replacement rate and future genetic improvement of the stock. The pre-weaning piglet mortality not only largely depends on management but also depends on various genetic and non-genetic factors such as genetic group, feed, housing system, system of rearing, litter size at birth, parity of dam and season of farrowing. Farm management should be planned to improve efficiency of production targeting long term sustainability by minimizing the piglet mortality. In this context, the present study was envisaged to ascertain the effect of various factors affecting the pre-weaning piglet mortality under field condition.

**2. Materials and Methods**

Records pertaining to 286 litters of HD-K75, HD-K75 X Ghoongroo and Ghoongroo pigs maintained at the private farms of KVK, Baksa operating villages were utilized

for the present investigation. The animals were maintained in three systems of rearing *viz.* intensive, semi-intensive and tethering system. The piglets were weaned at the age of 56 days.

Pre-weaning mortality was calculated as:

$$\text{Pre-weaning mortality(\%)} = \frac{\text{Litter size at birth} - \text{Litter size at weaning}}{\text{Litter size at birth}} \times 100$$

Data were classified into three genetic groups (HD-K75, HD-K75 X Ghoongroo and Ghoongroo), four parities of dam, three systems of rearing (intensive, semi-intensive and tethering) and four seasons of farrowing. According to climatic conditions prevailed in the state, the whole year was divided into pre-monsoon season (March, April and May), monsoon season (June, July, August and September), post-monsoon season (October and November) and winter season (December, January and February). To study the effects of various factors on pre-weaning piglet mortality, Least-squares analysis as given by (Harvey 1990) was carried out. The Duncan's Multiple

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Range Test (DMRT) as modified by (Kramer 1957) was used to make pair-wise comparisons among the means in order to test the significance of differences among the different subclasses in respect of various traits.

### 3. Results and Discussion

#### Pre-weaning piglet mortality

The average pre-weaning piglet mortality (%) was found to be  $23.001 \pm 0.603$  (Table 1) which was observed to be well in agreement with the findings of Nath *et al.* (2001) in Hampshire pigs, Nath *et al.* 2003 in Hampshire pigs and Kielland *et al.* 2018 in Norwegian Landrace X Swedish Yorkshire sows of Norway. Higher pre-weaning piglet mortality as compared to the present study was reported by Roychoudhury *et al.* 2005 in local pigs of Assam, Boro *et al.* 2016 in local pigs of Bareilly, Abah *et al.* 2019 in pigs of Nigeria, Singh *et al.* 2020<sup>a</sup> in local and crossbred pigs of Assam). On the other hand, lower mortality percentages as compared to present study were reported by Kumaresan *et al.* 2007 in Hampshire, Large White Yorkshire and nondescript pigs of Mizoram, Saharia *et al.* 2014 in Hampshire, Large Black and their Crossbred pigs, Gokuldas *et al.* 2015 in Hampshire, Duroc, Ghoongroo, Niang Megha, Hampshire X Ghoongroo and Hampshire X Niang Megha pigs, Kaushik *et al.* 2017 in Duroc and Hampshire pigs, Sharma *et al.* 2019 in Pakhribas, Hampshire, Puri and Hurrah pigs of Nepal, Singh *et al.* 2020<sup>b</sup> in Hampshire, Ghoongroo and Large Black pigs, Boro *et al.* 2021 in Ghoongroo pigs, Chakurkar *et al.* 2021 in 75% Large White Yorkshire X Indigenous Agonda Goan crossbred pigs in Goa.

#### Effect of genetic group

The results of least-squares analysis of variance (Table 2) for pre-weaning piglet mortality under study revealed that genetic group had no significant effect on pre-weaning piglet mortality, which was in consonance with the report of Ghimire and Dhaubhadel (2002) in Yorkshire and Landrace pigs of Nepal. Significant effect of genetic group on pre-weaning piglet mortality were reported by Kumaresan *et al.* 2007 in nondescript local pigs of Mizoram, Hampshire and Large White Yorkshire, Gokuldas *et al.* 2015 in Hampshire, Duroc, Ghoongroo, Niang Megha, Hampshire X Ghoongroo and Hampshire X Niang Megha pigs, Kaushik *et al.* 2017 in Duroc and Hampshire pigs. Although there was no significant effect of genetic group, there was marginally higher mortality percentage in Ghoongroo pigs followed by HD-K75 and HD-K75 X Ghoongroo pigs.

#### Effect of parity of dam

The results of least-squares analysis of variance

(Table 2) for pre-weaning piglet mortality under study revealed that parity of dam had no significant effect on pre-weaning piglet mortality and the finding was in close agreement with the findings of Nath *et al.* 2001 in Hampshire pigs, Pandey 2019 in Landrace, Desi and their crossbred. Although there was no significant effect of parity of dam, there was marginally higher mortality percentage in piglets born in third parity ( $23.912 \pm 1.174$ ) and marginally lower mortality percentage was observed among the piglets born in second parity ( $22.423 \pm 0.972$ ). The mortality percentage were  $23.239 \pm 0.934$  and  $22.428 \pm 1.628$  among the piglets born in first and fourth parity respectively

#### Effect of system of rearing

The results of least-squares analysis of variance (Table 2) for pre-weaning piglet mortality under study revealed that system of rearing had highly significant effect ( $P < 0.01$ ) on pre-weaning piglet mortality. However, (Xayalath *et al.*, 2021) observed that the pre-weaning piglet mortality did not differ significantly between rearing systems. Significantly higher pre-weaning piglet mortality percentage ( $25.794 \pm 1.000$ ) was noticed among the piglets reared in tethering system. This may be due to physiological stress as a result of tethering together with improper sanitation and hygienic measures. The mortality percentage was  $20.874 \pm 0.983$  and  $22.334 \pm 0.991$  respectively among the piglets under intensive and semi-intensive system.

#### Effect of season

Perusal of Table 2 showed that the season of birth did not exert significant effect on pre-weaning piglet mortality. Contrary to the present finding, significant effect of season of farrowing on pre-weaning piglet mortality was reported by Nath *et al.* 2001 in Hampshire pigs, Ghimire and Dhaubhadel 2002 in Yorkshire and Landrace pigs of Nepal, Pandey 2019 in Landrace, Desi and their crossbred. Although there was no significant effect of season, marginally higher mortality percentage in piglets born in winter season and marginally lower mortality percentage was observed among the piglets born in post-monsoon season. The mortality percentage was  $22.715 \pm 1.146$  and  $23.801 \pm 1.148$  respectively among the piglets born in pre-monsoon and monsoon season.

The overall pre-weaning piglet mortality of the private farms under KVK, Baksa operating villages in the present study was  $23.001 \pm 0.603$  % and it represented that the care and management of piglets during pre-weaning period was reasonably adequate. Pre-weaning mortality is one of the important facets to be considered for enhancing profitability in pig farm. Steps must be under taken to reduce the pre-weaning piglet mortality as much as possible. The

present study revealed that system of rearing profoundly influence pre-weaning mortality rate with significantly higher mortality under tethering system than the intensive and semi-intensive system. It appears that the tethering system of rearing be avoided.

**Table 1.** Least-squares constants (LSC), Least-squares means (LSM) along with Standard Errors (SE) of LSM, and the Results of DMRT for various factors affecting pre-weaning mortality (%)

Effect	Pre weaning mortality %		
	LSC	LSM $\pm$ SE	N
$\mu$		23.001 $\pm$ 0.603	286
<b>Genetic group</b>			
HD-K75	-0.313	22.688 $\pm$ 0.906	119
HD-K75 X Ghoongroo	-0.702	22.298 $\pm$ 1.042	83
Ghoongroo	1.014	24.015 $\pm$ 1.030	84
<b>Parity of Dam</b>			
1	0.238	23.239 $\pm$ 0.934	99
2	-0.577	22.423 $\pm$ 0.972	92
3	0.911	23.912 $\pm$ 1.174	62
4	-0.572	22.428 $\pm$ 1.605	33
<b>System of rearing</b>			
Intensive	-2.127	20.874 <sup>a</sup> $\pm$ 0.983	93
Semi-intensive	-0.666	22.334 <sup>a</sup> $\pm$ 0.991	95
Tethering	2.794	25.794 <sup>b</sup> $\pm$ 1.000	98
<b>Season of farrowing</b>			
Pre-monsoon	-0.285	22.715 $\pm$ 1.146	70
Monsoon	0.800	23.801 $\pm$ 1.148	70
Post-monsoon	-2.038	20.962 $\pm$ 1.093	74
Winter	1.523	24.524 $\pm$ 1.129	72

N= Number of observation

NB. Subclass means in a column with different superscripts differ significantly (P<0.05).

**Table 2.** Least- squares analysis of variance for factors affecting the preweaning piglet mortality (%)

Sources of variation	Pre-weaning piglet mortality (%)	
	df	MS
Genetic group	2	68.241
Parity	3	32.562
System of rearing	2	576.032**
Season of birth	3	168.156
Error	275	84.738
**= P<0.01		

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#### 5. Conflict of interest

The authors declare that they have no conflict of interest within themselves and others including the funding agency and the agency where the research was carried out.

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