Biological Forum – An International Journal **16(10): 86-88(2024)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Reproductive Performance of Large White Yorkshire Pigs in an Organized Farm

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(Received: 15 July 2024; Revised: 17 August 2024; Accepted: 11 September 2024; Published: 15 October 2024)
(Published by Research Trend)

ABSTRACT: This study was planned to analyse the reproduction performance and impact of non-genetic factors on reproduction traits in Large White Yorkshire (LWY) pigs maintained in organized breeding farm. Records on 224 breedable female pigs for the periods from 2015 to 2022 were collected from Pig Breeding Unit, PGRIAS, Kattupakkam and utilised for this study. Reproduction traits evaluated in this study were age at first farrowing (AFF), farrowing interval (FI), litter size at birth (LSB), litter weight at birth (LWB), litter size at weaning (LSW) and litter weight at weaning (LWW) and the estimated over all mean values were 464.56 ± 10.09 days, 244.03 ± 4.21 days, 7.685 ± 0.101, 9.967 ± 0.145 kg, 7.488 ± 0.098 and 54.900 ± 0.723 kg respectively. This study concluded that, non-genetic factors like period, season and parity effect all the reproduction traits in the studied LWY pig population.

Keywords: Reproduction performance, LWY, Organized farm, Non-genetic factors.

INTRODUCTION

In India, pig farming is highly unorganized because it's not popularised like other livestock and poultry industry. In last five years, pig farming is promoted by all type of peoples to strengthening their family economy because of high profit from pig rearing. Because of the increasing trend in consumption of pork, numbers of small holding pig farmers increasing drastically among especially young graduates. Development of good management practices like scientific rearing, feeding and breeding of pigs attract the farmers in right manner. Reproduction performance of pigs directly play a key role in satisfy the demand of animal protein by producing more piglets (Ramesh *et al*., 2012) and significant economic importance in the piggery industry as it directly impacts production costs and profits (Devendran *et al*., 2015). Analysis of farm data possibly will increase the distribution of useful information to maximize the sows reproductive potential, and also improve herd productivity in breeding herds (Koketsu *et al*., 2017). Hence, analysis of farm data was carried out to find the effect of period, season and parity on the reproduction performance of LWY pig in an organized farm.

MATERIALS AND METHODS

This study was carried out at Pig Breeding Unit, Post Graduate Research Institute in Animal Sciences, Kattupakkam, Chengalapttu, Tamil Nadu. The data pertaining to reproduction performance fulfil the objectives were collected from farm registers for the period of 2015 to 2022. All the pigs were maintained under intensive system of rearing with standard feeding, breeding and other management practices. In this study, age at first farrowing and farrowing intervals were calculated based on the farrowing date of the individual sow. Other traits such as litter size at birth (No's), litter weight at birth (kg), litter size at weaning (No's) and litter weight at weaning (kg) were recorded and analysed. The collected data were classified into four periods and four seasons to study the variation of non-genetics factors. To study the influence of period of birth, season of birth and parity, least squares analysis (Harvey, 1990) was carried out through SPSS software version 23 for statistical analysis. Further pair-wise comparisons of least squares mean within the factors, Kramer's (1957) modified Duncan's Multiple Range Test (DMRT) was performed.

RESULTS AND DISCUSSION

Among the different exotic pig breeds, Large White Yorkshire (LWY) pig is the most popular one reared all over the world because of its fecundity, faster growth rate, better-feed conversion ratio and well adopt to all environmental conditions. Because of different managemental practices, performance of LWY pigs vary from organised farm to field condition. So study was conducted to know the reproduction performance of LWY pigs under farm condition. The overall calculated average age at first farrowing and farrowing intervals were represented in Table 1 and litter traits like LSB, LWB, LSW and LWW were given under the Table 2.

The overall AFF and FI's were found to be 464.56 ± 10.09 and 244.03 ± 4.21, respectively. The overall calculated mean age at first farrowing and farrowing intervals in this study was higher in comparison with previous report by Paramasivam *et al*. (2021); Keyho *et*

al. (2017), respectively. The period of farrowing had highly significant source of variations and season of farrowing had no significant effect on AFF and FI's. Early age at first farrowing and shortest farrowing interval was noticed during the period of 2015 – 2016 and in the winter and north east monsoon season. Lalrintluanga (2015) reported 188.70 ± 3.99 and 212.90 ± 3.93 days of farrowing intervals in LWY pigs under extensive and organize systems of rearing respectively in Mizoram.

The period of farrowing had highly significant (p<0.01) effect on all the litter traits except litter weight at birth. The overall no significant difference was noticed in season on litter size at birth and period on litter weight at birth. In the present study, average litter size at birth was lower than the findings of Ramesh *et al.* (2012); Lalrintluanga (2015). Keyho *et al.* (2017) ; Li *et al.* (2017), reported maximum litter size at birth in LWY as 13.17 at Mannuthy, Kerala and 12.52 at South China, respectively. Litter size at birth in our findings, which was in close agreement with the result of Paramasivam *et al*. (2021). Lalrintluanga (2015); Paramasivam *et al*. (2021) reported litter size at weaning as 7.39 ± 0.23 and 7.63 ± 0.50 respectively which was in accordance with our findings. Based on our results, highest litter size at birth and weaning was noticed in South-West monsoon season and fifth parity. Significantly highest litter weight at birth was noticed on third farrowing and winter season and lowest on first farrowing and North-East monsoon season. Litter size and weight of weaning had highly significant with reference to the period and parity in this study. Among other non-genetic factors, significantly first parity was found as lowest value in all the litter traits.

Table 1: Least squares mean of age at first farrowing and farrowing intervals in LWY pig.

Effect	Age at first farrowing (days)		Farrowing intervals (days)	
	N	Mean ± SE	N	Mean ± SE
Overall mean	224	464.56 ± 10.09	395	244.03 ± 4.21
Period		**		**
2015-2016	25	377.50 ± 25.69^{c}	92	222.85 ± 8.07^{c}
2017-2018	61	429.44 ± 15.42b^{c}	126	230.49 ± 6.78^{bc}
2019-2020	79	455.29 ± 13.31^{b}	119	253.36 ± 7.05^{ab}
2021-2022	59	596.01 ± 15.65^{a}	58	269.41 ± 8.88^{a}
Season		NS		NS
Winter	21	434.34 ± 25.42	47	245.76 ± 10.90
Summer	67	460.87 ± 15.75	99	243.96 ± 7.62
South-west monsoon	96	486.76 ± 11.61	132	248.20 ± 6.71
North-east monsoon	40	476.28 ± 19.01	117	238.19 ± 6.95

SE = Standard Errors; N = Number of observations; **= Highly Significant; NS=Not Significant

Table 2: Least squares mean value of litter traits in LWY pigs under farm condition.

Effect	Litter size at birth (No's)		Litter weight at birth (Kg)		Litter size at weaning (No's)		Litter weight at weaning (Kg)	
	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE
Overall mean	725	7.685 ± 0.101	726	9.967 ± 0.145	724	7.488 ± 0.098	724	54.900 ± 0.723
Period		**		NS		**		**
2015-2016	125	7.921 ± 0.267^{b}	125	10.571 ± 0.383	123	7.713 ± 0.260^{b}	123	61.990 ± 1.943^{a}
2017-2018	208	8.200 ± 0.184^{a}	208	9.732 ± 0.265	208	7.841 ± 0.180^{a}	208	59.249 ± 1.316^{a}
2019-2020	207	7.414 ± 0.192^{bc}	207	9.782 ± 0.276	207	7.340 ± 0.188^{bc}	207	48.919 ± 1.371^{b}
2021-2022	186	7.174 ± 0.177^{c}	186	10.025 ± 0.254	186	7.035 ± 0.172^{c}	186	51.279 ± 1.260^{b}
Season		NS		*		*		*
Winter	91	7.885 ± 0.246a	91	10.691 ± 0.354^{a}	91	7.713 ± 0.240^{a}	91	58.111 ± 1.758^{a}
Summer	180	7.631 ± 0.194b	180	10.002 ± 0.279^{ab}	180	7.375 ± 0.190^{bc}	180	55.157 ± 1.387^{b}
South west monsoon	264	7.927 ± 0.171ab	264	9.751 ± 0.245^{b}	264	7.795 ± 0.167^{ab}	264	54.785 ± 1.218^{b}
North east monsoon	191	7.272 ± 0.195b	191	9.445 ± 0.280^{b}	189	7.039 ± 0.190^{c}	189	51.544 ± 1.423^{b}
Parity		**		**		**		**
1	317	7.039 ± 0.124^{b}	317	9.195 ± 0.178^{a}	317	6.836 ± 0.121^{b}	317	51.565 ± 0.886^{a}
2	191	7.657 ± 0.147^{ab}	191	10.165 ± 0.211^{a}	189	7.435 ± 0.143^{ab}	189	57.090 ± 1.050^{a}
3	121	8.097 ± 0.210^{ab}	121	10.949 ± 0.302^{a}	121	7.908 ± 0.205^{ab}	121	58.314 ± 1.533^{a}
4	65	7.746 ± 0.273^{ab}	65	9.793 ± 0.392^{a}	65	7.569 ± 0.266^{ab}	65	54.033 ± 1.949^{a}
5	24	8.510 ± 0.452^{b}	24	10.076 ± 0.649^{a}	24	8.378 ± 0.441^{a}	24	53.978 ± 3.224^{a}

SE = Standard Errors; N = Number of observations; **= Highly Significant; *= Significant; NS=Not Significant

CONCLUSIONS

This results provides a key information on influence of non-genetic factors on reproduction traits in LWY pigs. More attention on scientific pig farming practices plays a key role in the improvement on overall performance of pigs. The estimated overall mean of reproduction traits indicates potential of LWY pigs in that population and more care may be taken on management practices to avoid the variation due to non-genetic factors.

FUTURE SCOPE

Further research is recommended at different population and breeds to explore the effect of non-genetic factors on performance of pigs. Results of more research on pigs, will help to frame the breeding programme to achieve the improvement on performance of pigs.

Acknowledgements. The authors are thankful to All India Coordinated Research Project on Pig and Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) and for providing the necessary facilities to conduct the research work.

Conflict of Interest. None.

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How to cite this article: R.S. Kathiravan, A. Karthikeyan, M. Murugan, P. Tensingh Gnanaraj and D. Balasubramanyam (2024). Reproductive Performance of Large White Yorkshire Pigs in an Organized Farm. *Biological Forum – An International Journal, 16*(10): 86-88.