Full Length Article

INFLUENCE OF SEASON ON BIRTH OF PIGLETS IN SEMI-ARID REGION OF TAMIL NADU

P. Thirunavukkarasu[1*], R. Amutha[2], R. Sakthivadivu[3] and C. Nithya[4]

Livestock Farm Complex
Veterinary College and Research Institute
Tamil Nadu Veterinary and Animal Sciences University
Namakkal – 637 002

ABSTRACT

The study was structured to find out the seasonal influences on birth of piglets in tropical condition with the objective of probability in the birth of male and female piglets from 80 farrowing records for the period from 2017 to 2021. Depending on the season, male piglets are in more demand since they have to anticipate the demand for meat during festivals and other annual events. The parameters studied from farrowing records are litter size at birth and at weaning (42nd day). From this study, highest probability of male piglets were born during south west monsoon season where as the female piglets were born during winter season however, the pooled sex of piglets were born highest in winter season. It could be useful to the farmers who are in need of piglets for either meat production or breeding purpose.

Key words: Season; Sex of piglets; litter size; Semi-arid region;

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INTRODUCTION

Reproduction in pig is one of the important economic indices in commercial swine industry. The reproductive performance of sows comprising of total piglets born, a live born piglet at birth, piglets alive at weaning was perceived by Huang *et al*. (2003). Knecht *et al*. (2015) observed that reproductive performances of pigs is also affected by environmental factors like season which has great effect on farrowing, gilt management, length of lactation and boar fertility. The ancestor of modern swine breed, European wild boar, is a seasonal breeder and farrowing occurs mostly in early winter as reported by Mauget (1982). The reproduction in sows is largely influenced by the season and prevailing local climate. Increasing the length of photoperiod before the summer season which

[1]Assistant Professor,*Corresponding author Email id: karasudr@gmail.com

[2] Professor and Head, Veterinary University Training and Research Centre, Karur

[3]Assistant Professor

[4]Assistant Professor

regulates the fertility in sows was observed by Love *et al*. (1993). Schwarz *et al*. (2009) indicated that the litter size at birth is the most important reproductive coefficient and it is not only governed by the genetic factors, but also by environmental factors including climate zone, season and herd management (Dewey *et al*., 1995).

MATERIALS AND METHODS

Large White Yorkshire sows from Veterinary College and Research Institute, Namakkal were utilised in this study. The climate was generally hot, semi-arid and tropical in nature. A total of 80 farrowing records were collected over a period of 5 years starting from 2017 to 2021. The parameters like litter size at birth and weaning were recorded and categorized by seasons: Winter (December to February), Summer (March to May), South West Monsoon (June to August) and North East Monsoon (September to November) and analysed by performing generalized linear model (GLM) procedure of Stastical Analysis System (SAS). A comparison of means of the different subgroups was performed by Duncan's multiple range tests as described by Kramer, (1957).

RESULTS AND DISCUSSION

The mean number of piglets born alive and weaned at 42nd day based on season wise data is presented in the Table 1. De Rensis *et al*. (2017) found that the seasonal effect on production and reproduction performance of sow is considered as a greater challenge for modern pig industry. Seasonal infertility in sow still remains as aeccentric problem especially during summer season. The heat stress will mostly affect the ovulation rate and conception of sow during summer. The effect of season on fertility of sows was demonstrated by its rebreeding rate, farrowing rate and age of the gilt. Tantasuparuk *et al*. (2000) documented the season and environment as an important factor causing variation in sow fertility and these were consistent with findings of Love *et al*. (1993).

The birth of piglets in the spring season and its survival is more certain than in winter period was noticed by Peltoniemi and Virolainen, (2006). Chokoe and Siebrits, (2009) found that the temperature, lighting and day length will favour the occurrence of Summer Induced Sterility (SIS) where oestrus gets delayed which subsequently leads to reduced litter size.

The sows given birth in South West Monsoon had highest mean of male piglets (5.11) while it was lowest in winter season (difference 24.94%). The mean of male weaned piglets was also higher (4.78) in same season and lowest (4.00) were observed at both winter and summer (difference 18.18 %) and was also notified by Prunier *et al*. (1994), Love *et al*. (1995) and Peltoniemi *et al*. (1999). Even though, there is no marked difference between piglets born and weaned with respect to season and even with highest farrowing rate occurred at North East Monsoon followed by Summer season. The number of female born and weaned (5.25) was also high in winter season (difference 57.57 and 58.25 %) and lowest (2.78) in South West Monsoon which is well pronounced in winter season.

Table 1. Mean (±SE) number of piglets born and weaned on 42nd day based on seasons (From 2017 to 2021)

Season	n	Piglets live born			Piglets alive on 42nd day		
		Male	Female	Pooled	Male	Female	Pooled
Winter	4	4.00 ± 2.44 ^{b}	5.25 ± 2.21 ^{a}	9.25 ± 2.21 ^{b}	4.00 ± 2.44 ^{b}	5.25 ± 2.21 ^{a}	9.25 ± 2.21 ^{b}
Summer	32	4.25 ± 2.05 ^{b}	4.72 ± 2.00 ^{a}	8.97 ± 2.48 ^{b}	4.00 ± 1.95 ^{b}	4.66 ± 1.91 ^{a}	8.66 ± 2.37 ^{b}
South West Monsoon	9	5.11 ± 1.76 ^{b}	2.78 ± 0.97 ^{b}	7.89 ± 1.76 ^{b}	4.78 ± 2.22 ^{b}	2.78 ± 0.97 ^{b}	7.56 ± 2.18 ^{b}
North East Monsoon	35	4.51 ± 2.16 ^{b}	4.17 ± 1.76 ^{ab}	8.69 ± 2.79 ^{b}	4.46 ± 2.13 ^{b}	4.11 ± 1.77 ^{ab}	8.57 ± 2.80 ^{b}
P value	80	P>0.05	P<0.05	P>0.05	P>0.05	P<0.05	P>0.05

Winter: December to February,
Summer: March to May,
South-West monsoon: June to August,
North-east monsoon: September to November
Means bearing same superscript at each column and trait do not differ significantly at P<0.05

The total number of piglets born and weaned was high (9.25) in winter (difference 15.56 and 19.81 %) and lowest (7.56) in SWM which usually depends not only on litter size and also related to the length of reproductive cycle. Although the season of farrowing did not affect any trait of reproduction of sows significantly, the least squares estimates of seasonal effects suggested that litters were largest in January to April. Analogically, it was noted that the highest litter size at birth was observed for sows that were farrowing in February (Kramarenko *et al*., 2020). The birth rate during late summer and early autumn period shows the lowest value as suggestive of 'seasonal infertility period'. In litters born in winter were larger than in any other season of the year in Spanish Liberian Pig is correlated with the present findings (Dobao *et al*., 1983). The litter size also improved in winter than in the summer as found by Peltoniemi *et al*. (1999a).

CONCLUSION

As the study revealed that the highest male piglets were born in South West Monsoon season. The birth of female piglets and the total number of piglets was more in

Winter season. The litter size was more in Winter season followed by Summer season. This study aids farmers in choosing superior breeding stock and increases the likelihood of year-round sex births. From there, the farmer can then design a rearing system for either breeding or fattening purposes.

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REFERENCES

Chokoe, T.C. and Siebrits, F.K. (2009). Effects of season and regulated photo period on the reproductive performance of sows. *South African Journal of Animal Science*, **39**(1): 45 - 54.

De Rensis, F., Ziecik, A.J. and Kirkwood, R.N. (2017). Seasonal infertility in gilts and sows: Aetiology, clinical implications and treatments. *Theriogenology*, **96:** 111 - 117.

Dewey, C.E., Martin, S.W., Friendship, R.M., Kennedy, B.W. and Wilson, M.R. (1995). Associations between litter size and specific sow - level managemental factors in Ontario swine. *Preventive Veterinary Medi*cine, **23:** 101 - 110.

Dobao, M.T., Rodriganez, J. and Silio, L. (1983). Seasonal influence in fecundity and litter performance characteristics in Iberian pigs. *Livestock Production Science*, **10**(6): 601 -610.

Huang, Y.H., Yang, T.S., Lee, Y.P., Roan, S.W. and Liu, S.H. (2003). Effects of sire breed on the subsequent reproductive performances of Landrace sows. *Asian-Australian Journal of Animal Science*, **16**(4): 489 - 493.

Knecht, D., Srodon, S. and Duzinski, K. (2015). The impact of season, parity and breed on selected reproductive performance parameters of sows. *Archives of Animal Breeding*, **58:** 49 - 56.

Kramer, C.Y. (1957). Extension of multiple range tests to group correlated adjusted mean. *Biometrics*, **13:** 13 - 18.

Kramarenko, A.S., Ignatenko, Zh. V., Lugovoy, S.I., Pidpala, T.V., Karatieieva, O.I., Yulevich, O.I., Artyuhova, O.V. and Kramarenko, S.S. (2020). Effect of parity number, year and season farrowing on reproductive performance in Large White pigs. *Ukrainian Journal of Ecology*, **10** (1): 307 - 312.

Love, R.J., Evans, G. and Klupiec, C. (1993). Seasonal effects on fertility in gilts and sows. *Journal of Reproduction and Fertility supplement*, **48:** 191 - 206.

Love, R.J., Klupiec, C., Thorton, E.J. and Evans, G. (1995). An interaction between feeding rate and season affects fertility of sows. *Animal Reproduction Science*, **39:** 275 - 284.

Mauget, R. (1982). Seasonality of reproduction in the wild boar. In: Cole JA, Foxcroft GR, (Eds), In Control of pig reproduction, London. Butterworth scientific. pp. 509 - 526.

Peltoniemi, O.A.T. and Virolainen, J.V. (2006). Seasonality of reproduction in gilts and sows. *Reproduction*, Supple. **62:** 205 - 218.

Peltoniemi, O.A.T., Heinonen, M., Leppavuori, A. And Love, R.J. (1999). Seasonal effects on reproduction in the domestic sow-a herd record study. *Acta Veterinary Scandinavica*, **40:** 133 - 144.

Peltoniemi, O.A.T., Love, R.J., Heinonen, M., Tuovinen, V. and Saloniemi, H. (1999a). Seasonal and managemental effects on fertility of the sow: a descriptive study. *Animal Reproduction Science*, **55:** 47 - 61.

Prunier, A., Dourmad, J.Y. and Etienne, M. (1994). Effect of regimen under various ambient temperatures on sow and litter performance. *Journal of Animal Science*, **72:** 1461 - 1466.

Schwarz, T., Nowicki, J. and Tyszard, T. (2009). Reproductive performance of Polish Large White sows in intensive production - effect of parity and season. *Annals of Animal Science*, **9**(3): 269 - 277.

Tantasuparuk, W., Lundeheim, N., Dalin, A.M., Kunavongkrit, A. and Einarsson, S. (2000). Reproductive performance of purebred Landrace and Yorkshire sows in Thailand with special reference to seasonal influence and parity number. *Theriogenology*, **54:** 481- 496.