A STUDY ON PREWEANING POSTURAL BEHAVIOUR OF LARGE WHITE YORKSHIRE PIGLETS

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Abstract: A study was carried out to understand the behavior of piglets during preweaning period. Various behavioural traits viz., sleeping, ear twitch, body twitch, sleeping in contact, lying, sitting, standing and moving were recorded from birth to weaning at different hours in a day from morning 6 A.M to evening 6 P.M at 60 minutes interval for a continuous period of 56 days using thirty piglets for the study. The data was subjected to statistical analysis to arrive at conclusions. Highest mean proportion of piglets (42.44%) were found sleeping at 5 P.M and least at 4 P.M. and significant differences (P<0.001) were observed between most of the hours. Ear twitch and body twitch were expressed by majority of the pigs between 8 -10 A.M, while very few exhibited during the later hours of the day. Significant differences were noticed for ear twitch (P<0.001) between different hours while the body twitch did not differ significantly (P=0.004) between hours of observation. Maximum number of piglets were found to be sleeping in contact with each other at 5 P.M (8.93 %) and minimum number were at 3P.M (1.43%) and significant differences (P<0.001) were seen between certain hours. 19.82 percent of piglets were lying at 6 A.M. whereas, this behaviour reduced as the day advanced and a significant difference was observed (P<0.001) between morning and evening hours only. Highest percent of piglets (8.21%) were standing at 7 A.M. and least proportion of piglets at 11 A.M. and values differed significantly (P<0.001) between few hours. Highest proportion of piglets was sitting (6.31%) and moving (34.23 %) at 6 A.M. and least proportion of piglets were sitting at 8 A.M (0.48 %) and moving at 2 P.M (3.21 %) on an average during a day. The values were significantly different (P<0.001) between morning and evening hours. The piglet behavior appeared to vary from birth to weaning as the age advanced.
Keywords: preweaning, lying, sleeping, behavior.

Introduction

Pigs initially were wild animals but domestication of Sus *scrofa* may have occurred as early as 10.000 BC in Southeast Asia [3]. Behaviour exhibited by pigs in the wild naturally differs from those pigs which are domesticated and are in captivity. Earlier, pigs were reared traditionally in small to medium herds, in simple housing for providing comfort and warmth. Overtime, pigs are confined and reared under intensive system of housing [7]. As a result of confinement, pigs exhibit various behavioural changes and many behavioural problems.

One of the most essential factors which decide the ability of piglets to adapt to the post weaning environment is the piglet's pre weaning experience gained by their various behavioral traits [2]. Piglets are very intelligent and most fascinating creatures which show conspicuously various behaviours. Piglets may exhibit numerous normal as well as several abnormal behaviours and it is important to investigate and understand such behaviours in the interest of improving pig welfare and productivity.

Piglets express few behaviors individually or at times in group, they even display certain specific behaviours only during certain hours of the day. Piglet's behaviour could vary with advancement of age. Hence, an attempt was made to study these various postural behaviours of piglets at different hours of the day and at different weeks during their pre weaning age of life.

Material and methods

The behavioural pattern of piglets was studied for a continuous period of eight weeks (56 days) from birth to weaning by recording the behavioural traits at different hours in a day continuously from morning six AM to evening six PM at 60 minutes interval in the Department of Instructional Livestock Farm Complex, College of Veterinary Science, Proddatur, Andhra Pradesh. The study was conducted using total number of thirty Large White Yorkshire piglets from four litters housed in adjacent pens. The behavioural pattern of piglets was recorded using video camera in sequence way of recording behaviour [4] from outside the pen without interfering with the natural behaviour of the piglets during study period.

Various behavioural traits of piglets were observed and recorded via scan sampling procedure [4], viz., sleeping-piglet lies with eyes closed and may exhibit signs of reflex activity such as ear twitch & body twitch, sleeping in contact- piglets resting over the other piglets, lying- piglet lies with eyes open either on lateral/ventral recumbence, sitting- piglet sits like a dog supporting itself on its rear & 2 fore-legs, standing- piglet supports itself by standing on all four legs, without exhibiting any of the other traits, moving- piglet walks by lifting limbs separately. Further the data thus obtained was tabulated and subjected to suitable statistical analysis to arrive at conclusions.

Statistical analysis

The average number of animals exhibiting each behavior was computed week wise and hour wise to observe the effect of age and time of day on each behavior during pre-weaning period. The proportion of each behavior was calculated from the obtained average and data

was again transformed to meet the assumptions of normality and homogeneity, necessary for further statistical analysis. The transformed data was analyzed by General Linear Model one way Analysis of Variance. Tukey's Honest Significant Difference test was used to test the differences among the weeks and hours of each behavior. The trial version of Statistical Package for Social Sciences (SPSS) 20.0 was used for statistical analysis.

Results and Discussion

Postural behaviours exhibited by piglets during initial eight weeks are presented in Table 1and similarly the hourly comparative behaviours of piglets are presented in Table 2.

Sleeping: From table 1, it was observed that sleeping was one of the prominent behaviour found throughout the preweaning weeks of piglets, which was exhibited maximum during the fourth week. Statistical analysis revealed that second and sixth week differed significantly with fourth and fifth week (P=0.001). Hence, it was inferred that majority of the piglets spend their time sleeping which was similar to the reports given by [6].

With reference to table 2, piglets were found most inactive and sleeping during the mid-hours of the day. Highest proportion of piglets were found sleeping at the 12th hour (5-6pm) and this significantly differed (P<0.001) with majority of the hours except fifth, sixth and seventh hours of the day.

Reflex activities (Ear twitch and Body twitch): Ear twitch was well pronounced during eighth week while body twitch was observed highest during second week. Significant difference (P=0.002) was noticed for ear twitch between certain weeks viz., between third and fifth, eight week differed from fifth, sixth and seventh week. Whereas second week showed significant difference (P=0.005) with first, fifth, sixth, seventh and eight week for body twitch.

Majority of the piglets exhibited Ear twitch and Body twitch between 8 am and 10 am and also significant difference was observed for ear twitch (P<0.001) and body twitch (P=0.004) between various hours of the day which is clearly presented in Table 2.

Sleeping in contact: It was evidenced from the study that highest proportions of piglets were sleeping in contact during fourth week and also around late evening around 5pm. It was found that the frequencies of sleeping in contact with other piglets declined with age. This observation was in close agreement with [5]. Sleeping close to each other in physical contact is generally indicative of chilling temperature and even a common behavioural tendency of piglets [1]. However, significant differences (P<0.001) were observed between different

weeks and even between different hours of the study as described in Table 1 and 2, respectively.

Lying: In piglets this behaviour was found highest during fifth week (Table 1) and it was also observed that the difference in this behaviour between weeks was non- significant (P=0.470) throughout the preweaning stage. Hence, from the present studyit could be inferred that there was no effect of age on lying and the results were similar to the results of [2].

During the early hour (6 a.m) in the morning higher percentage of piglets were found lying with eyes open while this behaviour reduced as the day advanced and the mean percentage of piglets lying differed significantly (P<0.001) between hours as shown in the table 2.

Standing: From the experiment it was analyzed that mean proportion of piglets standing was highest during eighth week while least during first week of preweaning stage. Further it was observed that significant difference (P=0.007) was seen only between these two weeks. Hence, it could be inferred that this behaviour got increased and stabilized as the age advanced whereas this finding was in contrary to Newberry and Wood-Gush,1988.

Referring to the effect of time, majority of the piglets were found standing during morning (7 a.m) than the rest of the hours as depicted in table 2. Significant difference (P<0.001) was seen between various hours as given in table 2.

Sitting: Only very few piglets were observed sitting throughout the preweaning period and significant difference (P=0.031) was seen between few weeks only. It has been studied, that piglets assume sitting posture when they change their position from lying to standing or vice versa [7]. Hence, it could be assumed that even in this present study because of the similar reason sitting posture could have been displayed rarely by few piglets.

From the table 2, it can be reported that highest percentage of piglets were found sitting during early morning (6 a.m) followed by evening around 3 p.m and both these hours different significantly (P<0.001) with the rest of the hours.

Moving: Movement of piglets varied with the age, as the movement increased gradually from first week to fourth week of age and moderately declined during fifth and sixth week. Further it was recorded that highest movement was seen during seventh week where as in there was a moderate decline towards the end. Mean proportions of piglets expressing this particular behaviour did not differ significantly (P=0.252) between different weeks.

The intensity of movement was higher at the early hour and minimum at the ninth hour (2 p.m) as represented in the table 2. Both these hours differed significantly (P<0.001) from each other as well differed from the other hours of the study.

Conclusion

From the present study it may be concluded that majority of the piglets spent their time sleeping during their pre weaning weeks. It was also observed that piglets were active during morning hours and hence more piglets were involved in sleeping as the day advanced. The next major behaviour exhibited by majority of the piglets was moving and from the overall study period it may be reported that, piglets were found to be actively moving during the early morning hours than the rest of the time. The other important behaviour was lying which was almost in the same range throughout the preweaning age. Other behaviours viz., sleeping in contact, standing, sitting and reflex activities were not so prominent but displayed only by few piglets.

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Table 1. Postural behaviours of piglets during pre-weaning age
Weekly percentage (Mean±SE) of postural behaviours of piglets during pre-weaning age

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Sleeping	28.33 ± 2.27^{ab}	22.30 ± 0.87^{b}	29.13 ± 1.63^{ab}	30.40 ± 1.00^{a}	29.84 ± 2.14^{a}	22.30 ± 1.37^{b}	25.24 ± 1.69^{ab}	25.91 ± 1.36^{ab}
Ear twitch	1.79 ± 0.08^{abc}	1.67 ± 0.40^{abc}	2.18 ± 0.19^{ab}	1.67 ± 0.48^{abc}	0.72 ± 0.20^{c}	0.91 ± 0.25^{bc}	0.83 ± 0.34^{bc}	2.42 ± 0.44^{a}
Body twitch	0.87 ± 0.25^{b}	2.70 ± 0.48^{a}	1.31 ± 0.29^{ab}	1.27 ± 0.38^{ab}	0.99 ± 0.35^{b}	1.15 ± 0.29^{b}	0.83 ± 0.24^{b}	1.15 ± 0.20^{b}
Sleeping in contact	5.40 ± 0.63^{abc}	2.86 ± 0.39^{c}	3.65 ± 0.46^{bc}	7.06 ± 0.91^{a}	6.03 ± 0.92^{ab}	3.77 ± 0.34^{bc}	4.09 ± 0.36^{bc}	3.10 ± 0.33^{c}
Lying with eyes open	10.64 ± 1.17^{a}	11.43 ± 0.66^{a}	10.59 ± 0.91^{a}	12.30 ± 1.04^{a}	12.82 ± 0.87^{a}	12.58 ± 0.89^{a}	10.83 ± 0.62^{a}	11.86 ± 0.98^{a}
Standing	3.02 ± 0.87^{b}	4.05 ± 0.39^{ab}	5.64 ± 0.73^{ab}	4.17 ± 0.82^{ab}	3.37 ± 0.46^{ab}	3.69 ± 0.81^{ab}	5.91 ± 0.52^{ab}	6.03 ± 0.57^{a}
Sitting	1.47 ± 0.33^{b}	2.18 ± 0.54^{ab}	4.13 ± 0.71^{a}	2.82 ± 0.21^{ab}	2.94 ± 0.55^{ab}	3.45 ± 0.45^{ab}	2.62 ± 0.55^{ab}	2.70 ± 0.55^{ab}
Moving	14.05 ± 1.58^{a}	14.29 ± 1.39^{a}	15.12 ± 0.84^{a}	16.35 ± 2.04^{a}	14.56 ± 1.62^{a}	13.01 ± 1.54^{a}	18.53 ± 1.37^{a}	15.44 ± 0.87^{a}

$^{a-c}$Means sharing different superscripts in the same row differ significantly(Tukey's HSD)

Table 2. Postural behaviours of piglets during the different hours of the day
Hourly percentage (Mean±SE) of postural behaviours of piglets during pre-weaning age

	6am	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm
	1st hour	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
Sleeping	22.98± 2.01^{de}	15.48± 1.72^{e}	18.93± 2.19^{de}	29.40± 2.80^{bcd}	42.26± 2.79^{a}	38.10± 2.62^{abc}	38.21± 3.03^{ab}	27.68± 1.91^{cd}	15.30 ±1.90^{e}	15.36± 1.80^{e}	14.05± 2.01^{e}	42.44 ±1.84^{a}
Ear twith	2.38± 0.46^{abc}	0.65±0 .20^{cd}	0.65±0 .29^{cd}	4.23±0. 60^{a}	2.92±0. 58^{ab}	1.79±0 .64^{bcd}	2.86±0. 55^{ab}	1.37±0 .30^{bcd}	0.12± 0.12^{d}	0.30±0. 15^{d}	0.00±0. 00^{d}	0.54± 0.30^{cd}
Body twitch	1.49±0. 39^{ab}	1.25±0 .43^{ab}	2.20±0 .53^{a}	1.67±0. 47^{ab}	1.85±0. 49^{ab}	0.77±0 .24^{ab}	1.96±0. 73^{ab}	1.85±0 .41^{ab}	0.06± 0.06^{b}	0.42±0. 17^{ab}	0.83±0. 34^{ab}	1.07± 0.36^{ab}
Sleeping in contact	4.05± 1.00^{bcd}	1.43±0 .43^{d}	6.90±1 .22^{abc}	8.39±1. 14^{a}	3.10±0. 61^{bcd}	3.99±0 .63^{bcd}	7.02±1. 17^{ab}	3.15±0 .80^{bcd}	2.80± 0.66^{cd}	1.43±0. 52^{d}	2.74±0. 67^{d}	8.93± 1.30^{a}
Lying with eyes open	19.82± 1.57^{a}	15.36± 1.59^{ab}	10.77± 2.03^{bc}	7.86±1. 05^{c}	10.42± 1.35^{bc}	10.65± 1.21^{bc}	9.35±1. 06^{bc}	8.75±1 .17^{bc}	9.76± 1.45^{bc}	14.52± 1.64^{abc}	13.69± 1.80^{abc}	8.63± 1.50^{bc}
Standing	6.67± 1.09^{ab}	8.21±1 .54^{a}	3.10±0 .61^{bc}	4.17±0. 81^{abc}	1.96±0. 66^{c}	1.25±0 .48^{c}	3.81±0. 75^{abc}	2.68±0 .67^{bc}	5.30± 1.08^{abc}	6.85±1. 09^{ab}	5.54±1. 31^{abc}	4.29± 0.94^{abc}
Sitting	6.31± 0.87^{a}	1.49±0 .46^{c}	0.48±0 .27^{c}	3.27±0. 47^{bc}	3.10±0. 56^{bc}	2.14±0 .45^{c}	3.33±0. 75^{bc}	3.21±0 .82^{bc}	2.14± 0.53^{c}	5.54±0. 95^{ab}	1.61±0. 52^{c}	0.83± 0.44^{c}
Moving	34.23± 1.28^{a}	18.15± 1.96^{bc}	5.42±1 .17^{ef}	20.60± 1.88^{b}	15.30± 2.05^{bcd}	12.74± 1.47^{cde}	13.63± 1.93^{bcd}	18.69± 1.81^{bc}	3.21± 0.70^{f}	14.88± 1.52^{bcd}	16.31± 1.90^{bcd}	8.87± 1.27^{def}

$^{a-f}$Means sharing different superscripts in the same row differ significantly(Tukey's HSD)