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RESEARCH ARTICLE

Social Behavior of Large White Yorkshire Piglets during Pre-weaning Period Reared on Cement Concrete Floor

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ABSTRACT

After farrowing, 24-day-old Large White Yorkshire piglets of either sex from 3 L were reared on normal conventional concrete flooring along with their mother till weaning (56 days). The behavioral pattern of piglets was studied at different hours continuously from morning 6 am to evening 6 pm at 60-min intervals daily. The behavioral pattern of piglets was recorded by visual recording from outside the pen without interfering with the natural behavior of the piglets during the study period. It was observed that sleeping was one of the prominent behaviors found throughout the experimental period, which was exhibited maximum during the first fortnight. Lying postural behavior was highest during the fourth fortnight. Standing postural behavior was recorded highest during the third fortnight and it was statistically significant ($P < 0.01$) from the first, second, and fourth fortnight. Only very few piglets were observed in sitting posture throughout the experimental period. The mean percentage of moving postural behavior was highest in the third fortnight. There was an increasing trend in agonistic behavior as the age advanced. Nose contact and belly contact social behaviors were expressed highest during the fourth fortnight. Tail-biting social behavior was expressed only during the third and fourth fortnight. Ear-biting social behavior was expressed only at the fourth fortnight during the experimental period.

Key words: Cement concrete floor, large white Yorkshire piglets, postural and social behaviors, pre-weaning period

INTRODUCTION

Behavior is the reaction of an organism through which it interacts with the environment. Behaviors may indicate animal welfare, particularly in a confinement environment. Behavioral assessment has the advantage of being non-invasive,[1] a quick, and practical technique that measures the status of an individual in relation to the environment.[2]

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In recent years, there has been a growing concern about animal welfare due to the undesirable consequences on general productivity performance.[3] Increased demand for quality animal products has led to the intensification of production that compromises animal welfare.[4,5] Animal welfare, among other things, depends on the type of floor in their housing.[6] The floor as the main part of the house influences animal welfare by its design and material, which is then manifested in species-specific behavior, the occurrence of lesions and diseases, and convenience.[7] Flooring type

may affect animal behavior and growth performance if the flooring material causes stress to the animal. Bedding substrates can help animals adapt to a new environment by providing environmental enrichment. Therefore, the ideal bed needs to be hygienic, dry, resilient, and reasonably temperature resistant.

Earlier, pigs were reared traditionally in small to medium herds, in simple housing for providing comfort and warmth. Over time, pigs are confined and reared under an intensive system of housing.[8] As a result of confinement, pigs exhibit various behavioral changes and many behavioral problems. One of the most essential factors that 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.[9] Piglets are very intelligent and most fascinating creatures which show conspicuously various behaviors. Piglets may exhibit numerous normal as well as several abnormal behaviors and it is important to investigate and understand such behaviors in the interest of improving pig welfare and productivity. Piglet's behavior could vary with the advancement of age. A number of behavioral problems are associated with weaning piglets including belly nosing, ear and tail biting, and low intake of solid food. These appear to be less pronounced in piglets reared on outdoor systems, which initially consume more solid food and show less belly nosing and aggression than on indoor-reared piglets.[9]

Time spent resting occupies the majority of the time budget in growing-finishing pigs,[10] and therefore, an adequate lying comfort seems important for their welfare.[11] The aforementioned housing factors can compromise the ability of pigs to perform this activity adequately. Data relative to the allometric space required to satisfy pigs' different lying postures already exists,[12,13] but the quantitative relationships between housing factors and the percentage of time spent lying remain largely unknown. The evaluation of these relationships could provide valuable information to determine the impact of alternative management of systems on the welfare of growing-finishing pigs, and how it might be improved.

A pre-weaning housing system may also influence the negative side of the social interactions among piglets, namely, their agonistic behavior. Agonistic behavior is important for the establishment of a dominance hierarchy among new group members.[14]

MATERIALS AND METHODS

After farrowing, 24-day-old Large White Yorkshire (LWY) piglets of either sex from 3 L were selected from the pig unit and reared on normal conventional concrete flooring along with their mother till weaning (56 days). All the piglets during the pre-weaning period were housed under conventional housing with concrete floor along with their mother provided with a floor space of 9 m^2/sow in the covered shed with an asbestos roof. The experimental piglets were ear-notched for proper recording of the data. The needle teeth of the piglets were cut on the birthday. All the piglets were injected with iron dextran (Ferrextran 100 @100 mg/piglet) on the 4^{th} day and 14^{th} day and vitamin A (Vetinol -A @ 3 Lakh I.U./kg body weight) on the 14^{th} day of the experiment.

Experimental piglets during the pre-weaning period were provided with the creep ration as per ICAR (2013), the composition of the creep ration is presented in Table 1.[9] Cox and Cooper (2001) Creep feed was provided to piglets during the pre-weaning period once a day *ad libitum* in the creep area from the 21^{st} day of age. Behavior recording was done by scan sampling (collecting data at specified time intervals, and noting what each animal is currently doing as per Crews *et al*.[16] The investigator himself recorded all the behavioral parameters for the purpose.

The behavioral pattern of piglets was studied for a continuous period of 56 days from birth to weaning during the pre-weaning period by recording the behavioral traits at different hours continuously from morning 6 am to evening 6 pm at 60 min interval daily. Data of various postural and social behaviors recorded at hourly interval were tabulated, and daily and fortnightly averages for each behavior were calculated. The behavioral pattern of piglets was recorded by visual recording from outside the pen without interfering with the natural behavior of the piglets during the study period.

Various postural and social-behavioral traits of piglets were observed and recorded via scan sampling procedure. The description of various recorded behavior activities of piglets given by Table 1[9] Cox and Cooper (2001)are as follows.

The average number of animals exhibiting each behavior was computed fortnightwise to observe the effect of age 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. Behavioral 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 fortnights of each behavior. The trial version of Statistical Package for the Social Sciences (version 25.0; SPSS, 2019) was used for statistical analysis using SPSS statistical software.

RESULTS

Social Behaviors

Social behaviors studied in LWY piglets during the pre-weaning period were agonistic, nose contact, belly contact, tail biting, and ear biting. Data on the fortnightly mean percentage of social behaviors are presented in Table 2.

Agonistic

The fortnightly mean percentage of agonistic social behavior were 0.40 ± 0.16, 0.32 ± 0.16, 0.69 ± 0.23, and 0.57 ± 0.20 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed a non-significant difference among the means of all fortnights. Agonistic behavior was expressed highest during the fourth fortnight followed by the third, first, and second fortnight.

Table 1: Description of various postural and social behaviors in pigs

Social behaviors	Description
Agonistic	Piglet barges another piglet with head, may be accompanied by attempts to bite
Nose contact	Piglet touches another piglet or a sow, with its snout
Belly nosing	Piglet places snout on another piglet's belly or between their hind legs and moves snout in an up-down movement
Tail-biting	Piglet places another piglet's tail in its mouth
Ear biting	Piglet places another piglet's ear in its mouth

Nose Contact

The mean percentage of piglets showing nose contact was 1.64 ± 0.44, 1.81 ± 0.40, 1.22 ± 0.26, and 1.98 ± 0.29 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed non-significant ($P > 0.05$) differences among the means of all fortnights of nose contact social behavior. Nose contact social behavior was expressed highest during fourth fortnight followed by the second, first, and third fortnight.

Belly Contact

The mean percentage of piglets showing belly contact were 0.03 ± 0.03, 0.00 ± 0.00, 0.12 ± 0.07, and 0.17 ± 0.08 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed non-significant ($P > 0.05$) difference among the means of all fortnights. Belly contact was expressed highest during fourth fortnight.

Tail Biting

The mean percentages of tail biting were 0.00 ± 0.00, 0.07 ± 0.07, 0.00 ± 0.00, and 0.03 ± 0.03 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed non-significant ($P > 0.05$) differences among the means of all fortnights. Tail-biting social behavior was

Table 2: The mean% piglets expressing social behaviors during different fortnights pre-weaning

Social behaviors	Fortnights				SEM	*P*-value
	1	2	3	4		
Agonistic	0.40±0.16	0.32±0.16	0.69±0.23	0.57±0.20	0.096	0.520
Nose contact	1.64±0.44	1.81±0.40	1.22±0.26	1.98±0.29	0.178	0.471
Belly contact	0.03±0.03	0.00±0.00	0.12±0.07	0.17±0.08	0.028	0.088
Tail biting	0.00±0.00	0.07±0.07	0.00±0.00	0.03±0.03	0.019	0.500
Ear biting	0.00±0.00^{b}	0.00±0.00^{b}	0.00±0.00^{b}	0.25±0.08^{a}	0.024	0.000
N	14	14	14	14		

Means with different superscripts row-wise differ significantly: $P<0.05$, $P<0.01$

expressed by LWY piglets only during the third and fourth fortnight.

Ear Biting

The fortnightly mean percentage of ear-biting social behavior was 0.00 ± 0.00, 0.00 ± 0.00, 0.00 ± 0.00, and 0.25 ± 0.08 during the first, second, third, and fourth fortnight, respectively. Ear-biting social behavior was expressed only at the fourth fortnight during the pre-weaning period of LWY piglets. The statistical analysis exposed that the mean at the fourth fortnight was significantly ($P < 0.01$) different from the other three fortnights.

DISCUSSION

Social Behaviors

Social behaviors studied in LWY piglets during the pre-weaning period were agonistic, nose contact, belly contact, tail biting, and ear biting.

Agonistic

The fortnightly mean percentage of agonistic social behavior were 0.40 ± 0.16, 0.32 ± 0.16, 0.69 ± 0.23, and 0.57 ± 0.20 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed a non-significant difference among the means of all fortnights. There was an increasing trend in agonistic behavior as the age advanced indicating the fact that there was an increase interaction among all the piglets leading to fighting in competition letting agonistic happen. These findings are supported by the observations of Cox and Cooper,[9] Li,[17] and Cherryl *et al.*[18]

Nose Contact

The fortnightly mean percentage of nose contact social behavior were 1.64 ± 0.44, 1.81 ± 0.40, 1.22 ± 0.26, and 1.98 ± 0.29 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed non-significant ($P > 0.05$) differences among the means of all fortnights of nose contact social behavior. Nose contact social behavior was expressed highest during the fourth fortnight followed by the second, first, and third fortnight. Proportion of piglets showing nose contact was very less, but the trend was increasing as the age advanced. Similar findings were reported by Cox and Cooper[9] and Cherryl *et al.*[19]

Belly Contact

The fortnightly mean percentage of belly contact social behavior were 0.03 ± 0.03, 0.00 ± 0.00, 0.12 ± 0.07, and 0.17 ± 0.08 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed non-significant ($P > 0.05$) difference among the means of all fortnights. Belly contact social behavior was expressed highest during fourth fortnight followed by third, and first fortnight. Although the proportion of piglets engaged in belly nosing was very less an increasing trend from the first to fourth fortnight was noticed. These results are in agreement with Cox and Cooper[9] and Cherryl *et al.*[19]

Tail Biting

The fortnightly mean percentage of tail-biting social behavior were 0.00 ± 0.00, 0.07 ± 0.07, 0.00 ± 0.00, and 0.03 ± 0.03 during the first, second, third, and fourth fortnight, respectively. Statistical analysis revealed non-significant ($P > 0.05$) differences among the means of all fortnights. Tail-biting social behavior was expressed by LWY piglets only during the third and fourth fortnight. Present findings are in agreement with Cox and Cooper,[9] Li[17], and Cherryl *et al.*[19] who had reported that the proportion of piglets showing tail-biting behavior has very rare during pre-weaning period.

Ear Biting

The fortnightly mean percentage of ear-biting social behavior was 0.00 ± 0.00, 0.00 ± 0.00, 0.00 ± 0.00, and 0.25 ± 0.08 during the first, second, third, and fourth fortnight, respectively. Ear-biting social behavior was expressed only at the fourth fortnight during the pre-weaning period of LWY piglets. Cherryl *et al.*[19] reported that the highest proportion of piglets was observed during end of the pre-weaning period, that is, during seventh fortnight, which matches with the present findings.

CONCLUSION

Concrete floor did not cause any stress on piglets during the pre-weaning period as reflected by normal postural and social behavior expressed by LWY piglets during the pre-weaning period.

REFERENCES

1. Dupjan S, Schon P, Puppe B, Tuchscherer A, Manteuffel G. Differential vocal response to physical and mental stressors in domestic pigs (*Sus scrofa*). Appl Anim Behav Sci 2008;114:105-15.
2. Broom DM. Animal welfare: Concepts and measurement. J Anim Sci 1991;69:4167-75.
3. Miro SM, Fernando T, Ramon M, Escribano D, Fuensanta H, Madrid J, *et al*. Causes, consequences and biomarkers of stress in swine: An update. BMC Vet Res 2016;12:171.
4. Barnett JL, Hemsworth PH, Cronin GM, Jongman EC, Hutson GD. A review of the welfare issues for sows and piglets in relation to housing. Aust J Agric Res 2001;52:1-28.
5. Candiani D, Salamano G, Mellia E, Doglione L, Bruno R, Toussaint M, *et al*. A combination of behavioral and physiological indicators for assessing pig welfare on the farm. J Appl Anim Welf Sci 2008;11:1-13.
6. Mills DS, Marchant-Forde JN, Mcgreevy PD, Morton D, Nicol CJ, Phillips CJ, *et al*. The Encyclopedia of Applied Animal Behaviour and Welfare. Cambridge, United Kingdom: CAB International, Cambridge University Press; 2010. p. 269-270.
7. Kymalainen HR, Kuisma R, Maatta J, Sjoberg AM. Assessment of cleanness of environmental surfaces in cattle barns and piggeries. Agric Food Sci 2009;18:268-82.
8. Pavicic Z, Ostovic M, Mencik S, Kabalin AE, Vucemilo M, Matkovic K, *et al*. Postural behaviour in gilts housed on concrete and rubber slats during four seasons. Maced Vet Rev 2014;37:157-64.
9. Cox LN, Cooper JJ. Observations on the pre- and post-weaning behaviour of piglets reared in commercial indoor and outdoor environments. Anim Sci 2001;72:75-86.
10. Ruckebusch Y. The relevance of drowsiness in the circadian cycle of farm animals. Anim Behav 1972;20:637-43.
11. Tuyttens FA. The importance of straw for pig and cattle welfare: A review. Appl Anim Behav Sci 2005;92:261-82.
12. Ekkel ED, Spoolder HA, Hulsegge I, Hopster H. Lying characteristics as determinants for space requirements in pigs. Appl Anim Behav Sci 2003;80:19-30.
13. Petherick JC. A biological basis for the design of space in livestock housing. In: Baxter, SH, Baxter MR, MacCormack JA, editors. Farm Animal Housing and Welfare. Germany: Springer; 1983. p. 103-20.
14. Meese GB and Ewbank R. The establishment and nature of the dominance hierarchy in the domesticated pig. Anim Behav 1973;21:326-34.
15. Breuer K, Kay RM, Demmers TG, Day JE. The effect of floor type on ammonia emission, welfare, health and behaviour of growing pigs. BSAP Occas Publ 2004;31:157-63.
16. Crews J, Braude S, Stephenson C, Clardy T. The Ethogram and Animal Behavior Research. St. Louis: Washington University; 2002.
17. Li Y. Normal and Abnormal Behaviours of Swine under Production Conditions. Normal and Abnormal Behaviours of Swine under Production Conditions, The Pig Site. Available from: https://www.thepigsite.com/articles/2014 [Last accessed on 2025 Feb 02].
18. Cherryl DM, Prasad RM, Jayalaxmi P, Guruvishnu P. A study on preweaning postural behaviour of Large White Yorkshire Piglets. Int J Sci Environ Technol 2016a;5:1438-44.
19. Cherryl DM, Prasad RM, Guruvishnu P, Jayalaxmi P. A study on cross bred (Large White Yorkshire) piglet behaviour from birth to weaning in the hot and dry areas of Kadapa district of Andhra Pradesh. Global J Bio Sci Biotechnol 2016b;5:324-6.