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EFFECT OF ENVIRONMENTAL ENRICHMENT ON GROWTH PERFORMANCE OF EARLY WEANED PIGLETS

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ABSTRACT

The effects of environmental enrichment on growth performance of early weaned Large White Yorkshire (LWY) piglets were studied. Eighteen LWY piglets of either sex, weaned at 35 days of age were selected and divided into three groups with six piglets each. The group T_1 was taken as control where no enrichment was provided, while T_2 and T_3 groups were provided with paddy straw and plastic balls respectively for environmental enrichment. Significant difference ($P<0.05$) in growth parameters was observed between control and other treatment groups. At the end of the experiment, the group T_2 had the highest mean body weight (8.18 ± 0.21 kg), followed by T_3 (8.02 ± 0.09 kg) and T_1 (7.30 ± 0.43 kg). When compared to the control group, the daily weight gain (0.037 ± 0.12 kg) of the weaned piglets of T_2 were having significantly highest daily weight gain (0.059 ± 0.02kg), followed by T_3 (0.051± 0.05kg).

Keywords: Piglets, environmental enrichment, growth performance

INTRODUCTION

A diversified livestock farming technique is vital in our country for national food security and addressing the needs of a fast-rising population. In the Indian livestock sector, piggery plays an important role in uplifting the socio-economic status of the rural livelihood. According to the country's 20th livestock census, the pig population in India has reached 9.06 million, accounting for 1.69 per cent of India's total livestock population. Pigs generate 0.414 million tons of meat, accounting for 4.82 per cent of total national meat production (DAHD STAT, 2021). Despite of the cultural and theological taboos, the pig industry has recently emerged as the fastest expanding sector of the food industry (Pappas, 2013). Besides being highly prolific in nature, pigs are endowed with a variety of advantages, such as high growth

rate, improved feed conversion efficiency, low cost of production etc., all of which have motivated the youth to pursue the idea of pig farming. As the human population grows, the need for meat protein grows as well, necessitating an increase in production using available resources. In order to meet people's demands, better management approaches are essential and early weaning is one of the ways for boosting the productivity.

Weaning is a difficult and stressful period in a piglet's life, because it exposes them to a variety of challenges and stressors, such as separation from their mother, stress from a change in feed and stress from being mixed with unacquainted piglets. This change leads to aggressive fighting to establish dominance over others, all of which ultimately results in a lower growth performance during the post weaning phase. However, by enhancing the restricted piglets' surroundings, this problem can be overcome, reducing the stress of the weaning process. Animal welfare is improved in an enriched environment because it encourages them to engage in species-specific behaviour which positively influences their performance. Various enrichment facilities such as straw, balls, tyres, metal chains, hose pipes, toys, keys, bucket, canister, and so on may have a positive impact on pig welfare by boosting growth performance and reducing aggressive behaviour (Van de Weerd *et al*., 2003).

MATERIALS AND METHODS

The study was conducted at pig farm, Instructional Livestock Farm Complex, College of Veterinary and Animal Sciences, Pookode, Wayanad, Kerala for a period of fourteen days. Eighteen Large White Yorkshire (LWY) piglets of either sex weaned at the age of 35 days were utilized for the study. They were divided into three groups with six piglets each. The control group (T_1) was kept under the traditional management system, which comprised of a nine sq. m. concrete floor with no enrichment amenities. In T_2, the six experimental piglets were provided with paddy straw bedding of 2.5 cm thickness on the concrete floor. In T_3, three coloured plastic balls of various sizes (21.5 cm, 15.5 cm and 12.5 cm in diameter) were supplied on a concrete floor as enrichment. The experimental animals were fed according to ICAR (2013) nutrient guidelines and *ad libitum* fresh drinking water was made available to them. Coloured dyes were used to identify individual piglets in the group. All pigs were individually weighed at the beginning, in the middle and at the end of the experiment. They were individually weighed before weaning and a week later to determine the variation in growth rate due to weaning and mixing with

unfamiliar animals. The body weight (kg) of the piglets was recorded using a digital weighing balance. Routine management and hygienic practices were followed in a similar manner throughout the study period. Statistical analysis of the data was carried out by nonparametric tests like Kruskal Walli's ANOVA and Chi-square test. The data obtained on various parameters were statistically analyzed by using *SPSS Version 24.0*.

Fig. 1: T_1-Control group devoid of any enrichment facility

Fig.2: T_2- Piglets supplied with straw as enrichment facility

Fig.3: T_3- Piglets supplied with plastic balls as enrichment facility

RESULTS AND DISCUSSION

The overall mean body weights of piglets weaned at 35 days old provided with and without enrichments are presented in table 1.

The mean ± SE of initial body weights of piglets recorded in this study were 6.28 ± 0.25 kg, 6.54 ± 0.13 and6.59 ± 0.16 kg from piglets on Control (T_1), Straw enrichment (T_2) and Ball enrichment (T_3), respectively. On 7th day of the experiment the initial body weights of piglets recorded were 6.13 ± 0.24 kg, 6.00 ± 0.19 kg and 6.16 ± 0.15 kg for T_1, T_2 and T_3, respectively. The final body weights of piglets recorded in T_1, T_2 and T_3 were 7.30 ± 0.43 kg, 8.18 ± 0.21and 8.02 ± 0.09 kg, respectively. Perusal of the Table 1 revealed significant difference ($p<0.05$) between T_1, and T_2 in final body weight. The group T_2 with straw as enrichment

had the highest mean body weight (8.18 ± 0.21kg), followed by T_3 where balls were provided as enrichment (8.02 ± 0.09kg) and in control it was 7.30 ± 0.43kg. This may be due to the engagement of piglets in exploratory behaviour towards the added materials in the environment, which in turn lowered the post-weaning stress caused by mixing of unfamiliar piglets. As a result, aggressive behaviour reduced and growth performance improved. Adebiyi *et al*. (2020) proved that the body weight gain of the piglet placed on a concrete floor with straw bedding was higher (4.75 kg) than those raised on a conventional concrete floor with no enrichment (3.34 kg) which is in accordance with the present study. Similarly, Peeters *et al*. (2006) also suggested that straw as bedding material for environmental enrichment to pigs in confinement had a significant impact on body weight gain even within a short time period of 14 days. Also, Gracner *et al.* (2013) used various enrichment materials like a car tyre on the floor, a hanging ball, a ball on the floor and a hanging chain, to assess the effect of environmental enrichment objects on weight gain in weaned pigs and concluded that balls as environmental enrichment objects had a favourable effect in weaners.

When compared to the control group (0.037 ± 0.12 kg), the daily weight gain of the weaned piglets was found to be significantly influenced by straw and balls, with the straw enriched group having the highest daily weight gain (0.059 ± 0.02kg), followed by the balls enriched group (0.051± 0.05kg). Similar finding was also reported by Oliveira *et al.* (2016). It was also observed that the weaned piglets supplied with and without enrichments lost their body weight in the first week, after which there was significant increase in their body weight between the groups, which is in agreement with the findings of Vijin (2017).

CONCLUSION

The addition of paddy straw and three coloured plastic balls as enrichment

Table 1: Effect of enrichments on body weight in piglets weaned at 35days (Mean ± SE)

Body weight	Body weight of piglets weaned at 35 days (kg)			(P-value)
	T_1	T_2	T_3	
Initial weight	6.28 ± 0.25	6.54 ±0.13	6.59 ± 0.1	10.307^{ns}
Weight on 7th day	6.13 ± 0.24	6.00 ±0.19	6.16 ±0.15	0.950^{ns}
Final weight	$7.30±0.43^{b}$	$8.18±0.21^{a}$	$8.02±0.09^{ab}$	0.036*
Average daily weight gain	$0.037 ± 0.12^{b}$	$0.059 ± 0.02^{a}$	$0.051± 0.05^{ab}$	0.021*

* Means having different letters as superscript differ significantly at p<0.05
ns –non significant

objects improved the growth rate, as shown by increased body weight gain. Thus, enrichment with straw bedding and balls could be recommended as important management practice in pig farming for improving the growth performance in post weaned piglets.

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