

## Effect of Music Rhythm on Growth Performance of Growing Pigs

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### ABSTRACT

Fifteen crossbred barrows (Largewhite X Landrace X Duroc) with average liveweight of 30 kg. were divided into 3 treatments (5 pigs/treatment) in a completely randomized design experiment to determine the effects of audio-stress on their growth performance. All the animals were fed with the corn-soyabean based diet. The treatments were natural (silence) sounds, light music and rock and roll music during feeding times, respectively.

It was found that there was no significant difference in dry matter intake but the DRG of the pigs in the fast rhythm music groups was lower ( $P < 0.05$ ) and FCR was higher ( $P < 0.05$ ) than the other two groups. It was concluded that loud noise and fast rhythm music could lower growth performance of the pigs.

**Key words :** pig, environment, performance, audio-stress

### INTRODUCTIONS

Noise can be defined as unwanted sound, from a variety of sources in the environment. Noise can be considered a stressor if it occurs where animals are located and if it affects their behaviour and productivity or induces physiological changes (Ames and Arehart, 1972; Moberg, 1987).

In some situations music is played (via radio-cassette) to reduce boredom of farm hands (Kilgour and Dalton, 1983) while in other situations noise from radio were used to keep animal from being frightened by strange sounds, although it was pointed out that the music did not enhance animal production at the animals' level. Nevertheless, in some instances when the sound level is too high, it could lower animal production (Head et al., 1993)

A satisfactory growth rate of pigs can be achieved if the animals receive sufficient amount of nutrients to satisfy their growth for a particular environment. The amount of dry matter intake can be affected by various factors and one of which is behavioural factor. The responses of the pigs to physical form of feed, smell, taste and possibly level and frequency of sound in the vicinity could effect the amount of food ingested. The sound threshold expected to cause a behavioural response by the animals is 85 to

90 dB (Muller, 1987). Response by the animals would be expected to vary with noise type, level and frequency.

In a large piggery where pigs are raised intensively, the sound level produced by squealing pigs simultaneously just before feeding time could influence both working performance of the animal attendance and growth performance of the pigs themselves. Therefore, the experiment is designed to investigate the effect of sound frequency or music rhythm on the growth performance of the finishing pigs.

### MATERIALS AND METHODS

Fifteen burrows (Landrace X Large white X Duroc), approximately 30 kilograms liveweight each, were stratified randomized by liveweight and allocated into 3 treatments in a Completely Randomized Design experiment (Steel and Torrie, 1980). There were 5 animals in each treatment. The pigs were housed in similar single pens and those pens were in 3 different pig sheds of similar design and construction within walking distance between the sheds. Hence, the interference of the sound treatments between the groups was prevented by the distance. The treatments are as following:

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- Treatment 1 (control) - No music.  
 Treatment 2 - Slow rhythm music (light music) between 80-85 dBs.  
 Treatment 3 - Fast rhythm music (rock and roll) between 80-85 dBs.

During each feeding time the music was played through portable cassette player in front of the pens of the treated pigs. The sound levels were measured at the pigs' ears. The music was switched off immediately after each feeding session. All animals received the same ration (Table 1) and were fed ad libitum at 07:30 am and 15:00 pm daily. The feed offered at each meal was calculated using the formula:

$F(g.) = 60W^{0.75}$ , where W = liveweight in kilograms.

The pigs were allowed 30 minutes to finish their meals for each feeding after which the feed refusals were thoroughly collected for dry matter refusal determination, using the forced draft oven technique. Water was freely available throughout the experimental period via drinking nipples.

The results obtained were analysed using SAS software (SAS, 1988) for Analysis of Variance and Duncan's New Multiple Range Test was applied when appropriated.

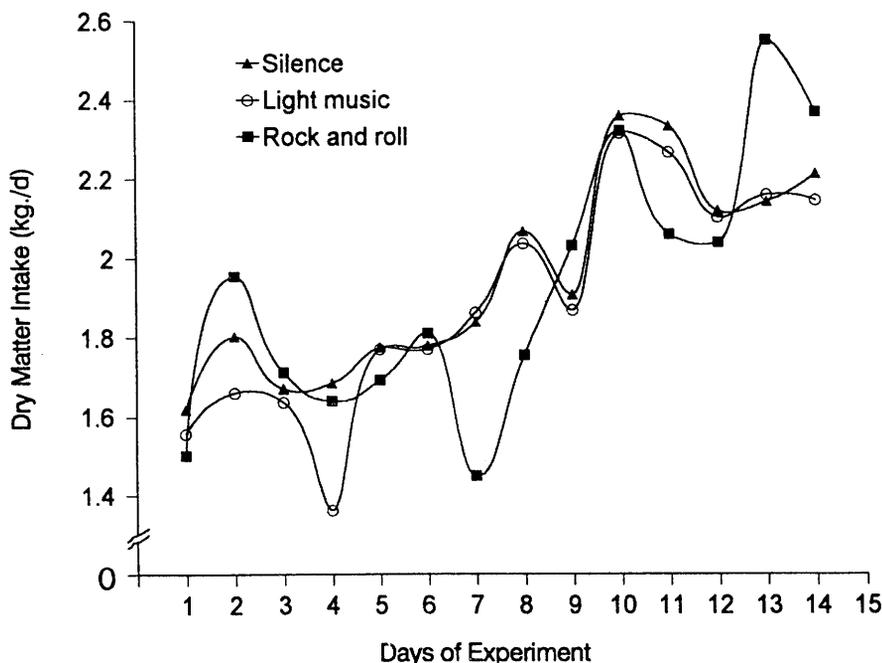
## RESULTS

The feed composition of the diet used in the experiment is shown in Table 1 and the average daily dry matter intake of the pigs in the present experiment are shown in Figure 1.

From Table 2 it can be seen that although there were no significantly differences in the environmental conditions of the 3 sheds used to house the pigs, the daily dry matter intake of the pigs in

**Table 1 Feed composition (air dried basis).**

Constituent	Kilograms
Maize	37.29
Rice pollard	15.29
Soyabean meal	30.42
Fish meal	7.00
Calcium di phosphate	4.00
Tallow	5.00
Vit./min. + sulphur drug	0.50
NaCl	0.50
Total	100.00
Calculated:	
ME. (MJ/kg. - DM)	13.22
Crude protein (%)	22.0



**Figure 1 Daily dry matter intake of the pigs in the 3 treatments.**

**Table 2 Environmental conditions of the sheds and growth performance of the burrows used in the present experiment.**

Parameter	Treatment 1 (silence)	Treatment 2 (light music)	Treatment 3 (rock and roll)
Average maximum temp. (oC)	35.14	35.54	35.29
Relative humidity (%)	68.89	70.18	66.93
Initial liveweight (kg.)	36.20	35.70	36.30
Final liveweight (kg.)	49.40	48.20	43.60
Number of experimental day	14	14	14
DRG (g/d)	943a	879a	521b
Dry matter intake (kg/d)	1.95	1.90	1.91
FCR (kg/kg)	2.07b	2.16b	3.86a

Means within line with different superscripts are statistically difference ( $P < 0.05$ ).

treatment 3 shows erratic movement more than the other 2 treatments over the experimental period (Figure 1).

From Table 2 it can be seen that there was no significant difference in the daily dry matter intake among the treatments. However, the daily rate of gain (DRG) of treatment 3 was lower ( $P < 0.05$ ) than that of the other two treatments while the feed conversion ratios (FCR) of the pigs in treatment 3 was higher ( $P < 0.05$ ) than that of the pigs in the other two treatments.

## DISCUSSION

As the level of the sound that applied in the present experiment is considered to be a loud noise which could be a stressor to the pigs. The sound intensity of 120 dB is said to be the limit of tolerance for the pigs. However, the level of the sounds employed in the present experiment was well under the limit of tolerance but it was approaching the sound threshold level that could cause a behavioural responses. Therefore, it was anticipated that the noise treated animals would consume less feed than the untreated ones as it has been shown that in a silent environment piglets gained 27.2 g. milk per suckling but in the noisy piggery only 22.1 g. milk per suckling is achieved (Algers and Jensen, 1985). Nevertheless, the results from the present study revealed is achieved that the daily dry matter intake (DMI) of those pigs treated with musical noises were lower, but not statistically significance than no music group. The non statistically significant difference could be attributed to the great

variation in the DMI within each treatment over the experimental period (Figure 1)

It has been known that sudden noises cause reaction of fright, especially in the pigs and poultry, depending on other stimuli and the degree of habituation (Muller, 1987). Noise affects animals by activating the autonomic nervous system and the hypothalamus-hypophysis-adrenal cortex system. This speed up circulation, and the metabolism of energy, along with other bodily functions such as acceleration of heart beat and respiration rate (Haberlah and Jeschke, 1975). Such extra-physiological efforts require extra energy supply.

Furthermore the results revealed that the pigs that received fast rhythm music treatment have lower DRG and higher FCR than the other two groups. Hence the animal with the rock and roll music treatment may be stressed to a higher level than the other two groups which included the light music treatment. Ames and Arehart (1972) suggested that soothing sounds such as light music are less stressing than other types. The pigs in the rock and roll music treatment might require higher maintenance energy in such stressful conditions (Freeman, 1975; Brander and Pugh, 1971) as those pigs in the experiment with noise carried out by Bresson (1982).

Therefore it seems that not only the level of noise but also the rhythm or sound frequency can influence the pigs' growth performance as it has been demonstrated here that fast rhythm of the rock and roll music depressed the growth performance of the finishing barrows.

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