

EFFECT OF STOCKING DENSITY IN GROWING PIGS

I. BEHAVIOUR PATTERN

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Pig farming is becoming a popular subsidiary occupation for the farmers in Kerala. However, modern pig farming facilities are extremely expensive to construct and operate. Thus, the farmer needs to maximize the body weight gain of the animals in a given facility within a specific time period, so that facility cost per unit pork production is minimized. However, there is evidence that increasing population density beyond a limit may lead to abnormal behaviour and vices such as tail-biting, cannibalism and the increased level of aggression among the pigs. Such abnormal behaviour is likely to be detrimental in that the performance of individual animals with low status in the group hierarchy may be depressed because of stress. The crowding that often occurs under intensive swine production consists of two elements, a decreased amount of space per pig and an increased number of pigs per group. Most researchers investigating housing density for swine have confounded group size and space allowance per animal by simply adding more pigs to a pen of a given size. Studies that have examined the separate effects of group size and space per pig indicate that both factors may depress animal performance. The objective of the present study is to find out whether there is any change in the pattern of

behaviour in pigs due to change in stocking densities.

Materials and methods

Twenty seven Large White Yorkshire weanling female pigs belonging to the Pig Breeding Farm, Kerala Agricultural University, Mannuthy, having an average body weight of 8.5 kg. and 56 days of age were assigned at random, as uniformly as possible with regard to the body weight, to three treatment groups. Pigs were housed in three identical cement concrete floored open sties. In the first (control) group of six pigs, each received 1 m² of floor space as per ISI specification (Indian Standards: 3916, 1966) while in the second and third group there were nine and twelve pigs respectively and provided with 0.75 m² and 0.5 m² of floor space per pig respectively. The pigs were fed concentrate mixture which contained 18 per cent crude protein, for a period of four months from weaning and thereafter a ration having 14 per cent crude protein. The rations contained a calculated level of 74 per cent total digestible nutrients/digestible energy of 3256 Kcal. Everyday at 09.00 hours, and 14.00 hours animals were provided with concentrate in the feed trough and allowed to consume as much as they could within a period of one hour. Drinking water was provided at

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all times in the sty. Pigs were maintained for a period of five months from weaning as per routine farm management. Behaviour of pigs were studied for a duration of one hour each at feeding time in the morning and afternoon. Competitive, aggressive and other behavioural patterns manifested were recorded. Number of threats and ear bitings were counted during feeding time. The other behavioral observations were made just before, during and after feeding to find out any change in the pattern of behaviour. One group was observed for their behaviour pattern on one day and the other two groups were observed on subsequent days. This pattern was repeated for a period of five months. The data collected during the course of the study were statistically analyzed as per standard procedure (Snedecor and Cochran, 1967).

Results and discussion

Aggressive behaviour was measured by counting the number of threats and ear-biting incidence during the feeding time and presented in Table 1.

Comparison by t-test showed significant differences in number of threats between three

stocking density groups. Number of ear-biting during the feeding time also revealed significant differences between control group and group III (0.5m²/pig) and also between group II (0.75 m²) and group III (Table 1).

During feeding time, animals tried to displace each other from the manger. This activity was noticed from third month onwards. In the study, higher rates of competition and aggression were noticed at higher stocking density. The result obtained in the study is in agreement with that of several others (Bryant and Ewbank, 1972., Ewbank and Bryant, 1972., Hamilton, 1974., Kelley *et al.*, 1980., Randolph *et al.*, 1981., Ross and Curtis, 1976) who have reported higher incidence of aggressive behaviour at higher stocking densities. Immediately after feeding, the animals at lower stocking rate preferred to relax while in the other groups a few animals continued to actively chase and tease other animals. The present result is also in agreement with the reports of several workers (Hajek, 1984., Heitman *et al.*, 1961., Ross and Curtis, 1976).

The pigs marked an area near the door for defecation and urination. Animals in heat

Table 1 Aggressive behaviour of pigs and its comparison between groups

Aggressive Behaviour	Behaviour in groups			Comparison of behaviour in groups (t-value)		
	I	II	III	I x II	I x III	II x III
Number of threats/day	10.24 ± 0.706	12.65 ± 0.716	15.21 ± 0.775	-2.4017 S*	-4.7462 S**	-2.4279 S*
Number of ear bitings/day	1.0 ± 0	1.2 ± 0.133	2.1 ± 0.211	1.5 NS	3.596 S**	-3.750 S**

S* - Significant at 5% level

S** - Significant at 1% level

NS - Non-significant

showed frequent mounting on other animals. Pigs used the drinking water tank for wallowing during the initial periods of experiment and afterwards they used to dip only their head portion in the tank. A few incidence (33.3 per cent in control, 33.3 per cent in group II and 50 per cent in Group III) of tail-biting was also noticed during the first two months of experiment and it disappeared afterwards. The increased incidence of tail-biting recorded in the pens with higher stocking density is in close agreement with the findings of previous workers (Cornelius *et al.*, 1981., Fritschen, 1976) even though it was at variance with another report (Kelley *et al.*, 1980) which claims non-significant effect of stocking density on the incidence of tail-biting behaviour.

Summary

A study was designed to find out whether there was any change in the pattern of behaviour in pigs due to change in stocking densities. Aggressive behaviour was measured by counting the number of threats (10.24 ± 0.706 , 12.65 ± 0.716 and 15.21 ± 0.775 at 1 m^2 , 0.75 m^2 and 0.5 m^2 floor space per pig) and number of ear-biting incidence (1 ± 0 , 1.2 ± 0.133 and 2.1 ± 0.211 at 1 m^2 , 0.75 m^2 and 0.5 m^2 floor space per pig). These parameters were found to be highest at higher stocking densities.

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