

# A COMPARISON OF FOUR TYPES OF FLOOR FOR HOUSING GROWING PIGS IN THE HIGHLANDS

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## ABSTRACT

*An experiment was conducted at Goroka (altitude 5,000 feet) with 16 pigs in a 4 x 4 Latin square to compare four different types of floor in a bush materials house. The floors used were elephant grass (*Pennisetum purpureum*) deep litter, wooden slats, bare earth and concrete. No significant differences were observed for weight gain, food consumption or efficiency between any of the treatments.*

## INTRODUCTION

Pig housing in the developing countries must fulfil two criteria. It must be cheap and it must be effective. For this reason as much use as possible must be made of materials available at no cost to the farmer. These include such materials as rough timber, bamboo, grass and leaves. Pig houses from such materials will spare the farmer the expense and technology involved with the more usual concrete and steel structures used in developed countries.

The two most important parts of a pig house are the roof and floor. The present study was concerned with evaluating four different types of floor with a bush materials pig house.

With respect to floors, Bond, Kelly and Heitman (1958) recommended that pigs in high temperature areas should have 15 square feet of shade per pig, that they should have access to wallows and that a concrete floor should be used, preferably cooled by surface moisture.

Meuhling (1969) reviewed the literature on space requirements and type of floor (solid v. slatted) for growing pigs. Combs and Wallace (1962) were the first to show the space allocations on concrete floors as low as 8 square feet were satisfactory. For slatted floors, similar minimal spatial requirements were shown by Jensen, Becker and Harman (1963).

Slatted floors are widely used in South East Asia by small producers (Marsh 1940); Jensen and Becker (1961) showed that pigs raised on slatted floors grew more quickly than those on concrete. The main advantage with slatted floors has been that they reduce labour requirements because they are self-cleaning.

There appears to be little published critical work on the use of deep litter for pigs. Godoy *et al.* (1970) compared wheat straw on concrete, wood boards on concrete and concrete floors for growing pigs. They found no difference in performance, but it is doubtful if a true fermenting deep litter was obtained. Unpublished work by the author (Malynicz 1970) has shown that there was no difference in weight gain or feed efficiency with pigs raised on elephant grass straw litter at spatial allocations ranging from 5 to 25 square feet.

The present experiment was conducted to compare elephant grass deep litter *Pennisetum purpureum*, rough timber slats, hand poured concrete and bare earth floors for growing pigs.

## MATERIALS AND METHODS

A house was constructed from bush materials. This contained four pens with dimensions 5 x 10 feet. The whole house was roofed with *Imperata cylindrica* thatch. The roof was at an angle of 45 degrees, and it overhung the ends of the building by 3 feet. Provision was made to collect water from the roof. The walls were made from split timber posts. The four flooring treatments were allocated at random to the four pens.

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The deep litter pen contained a layer of 6 inch boulders on the ground with a layer of sun-dried elephant grass at an initial depth of 6 inches. Fresh straw was added daily sufficient to cover faeces.

The slatted floor was erected 1 foot above ground level. Rough timber slats were fashioned to provide approximate cross sectional dimensions of 3 x 1 inch. They were laid approximately 1 inch apart.

The third floor type was simply bare beaten earth. The last was a concrete floor laid by hand. There was no insulation or damp course. This is similar to concrete floors laid by village producers.

Four litters of four British pigs of various breeds were used in the experiment. All pigs were 15 weeks old at the beginning of the experiment. The feed for all pigs on the trial was a commercial 18 % crude protein ration\* based on sorghum. Food and water were available at all times.

The experimental design used was meant to overcome the problems of uneven growth resulting from mixing litters and of differences between litters in growth rate. It was a 4 x 4 Latin square with litters forming columns and period forming rows. A Latin square was chosen at random from six described by Ruszczyk (1970).

Each period lasted 3 weeks and the whole experiment 12 weeks. The experiment was conducted during the months of November to February which is the wet season at Goroka (Clark pers. comm.). Pigs were weighed at the beginning and end of each period. Food consumption was recorded.

## RESULTS AND DISCUSSION

Average daily weight gain, food consumption and efficiency are shown in Table 1. There were no significant differences between treatments, or litters, for any of the parameters. There were significant differences between periods for food consumption and efficiency.

The deep litter system is widely recommended in the Highlands where nights are cold and pigs can burrow into the warm compost. The slatted floor probably has more

application for coastal conditions where temperature and humidity are higher, and maximum air circulation is needed. Slatted floors should be cleaned out regularly or poultry used to consume spilt food and fly larvae which might hatch.

Table 1.—Performance of growing pigs on different floors

|                                   | Type of floor |            |            |          |
|-----------------------------------|---------------|------------|------------|----------|
|                                   | Deep Litter   | Wood Slats | Bare Earth | Concrete |
| Ave. Daily gain (lb)              | 1.34          | 1.36       | 1.51       | 1.49     |
| Ave. Daily Food* Consumption (lb) | 5.23          | 5.28       | 5.38       | 5.78     |
| Feed Efficiency <sup>1</sup>      | 4.01          | 3.99       | 3.65       | 3.90     |

\* Significant differences occurred between periods.

The bare earth floor is not recommended for hygienic reasons. In this experiment no deleterious effects were observed. Over an extended period the ground would become heavily contaminated with parasites and micro-organisms. The pigs dug out a wallow in the earth floor.

Significant differences occurred in food consumption and feed efficiency between different periods. Food consumption was lowest and efficiency highest during the first period and vice versa during the second period. There were no significant treatment x period interactions. There were no significant differences between litters on any of the parameters.

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## REFERENCES

- BOND, T.E., KELLY, C.E. AND HEITMAN, H. (JR) (1958). Improving livestock environment in high temperature areas. *J. Heredity*, 49:75.
- COMBS, G.E. AND WALLACE, H.D. (1962). Feeder and floor space studies with growing finishing pigs. *Florida Agr. Exp. Sta. Report Series*, 63:6.
- GODOY, M.F., SKOKNIC, A.K., CORNEJO, S., ROMERO, J.J.T. AND CIFUENTES, M.C. (1970). The effect of three different bedding materials on the performance of fattening pigs during the winter period. *Agricultura Technica*, 29:50.

\* Kaiani Feeds, Lae.

- JENSEN, A.H. AND BECKER, D.E. (1961). Floor designs and materials in housing growing-finishing pigs. *Illinois Agr. Expt. Stat. Pub.*, AS-554.
- JENSEN, A.H., BECKER, D.E. AND HARMON, B.G. (1963). Space allotments for pigs on slatted floors. *Illinois Agric. Exp. Stat. Pub.*, AS-587.
- MALYNICZ, G.L. (1970). Spatial requirements of growing pigs on straw deep litter in a tropical environment. Unpublished report from Trop. Pig. Breed. Res. Cent.
- MARSH (1940). Pig Keeping in Malaya. *Malayan Agric. J.*, 28:3.
- MEUHLING, A.J. (1969). *Swine Housing and Waste Management—A research review*. University of Illinois.
- RUSZCZYC, Z. (1970). *Experimental methods in Animal Production*. P.W.R.L. Warsaw.

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