



## Economic Assessment of Hog Raising in Different Types of Housing

Eunice Lagrimas Lluz\*

Chair, Agribusiness and Agricultural Economics Department,  
College of Agriculture, Fisheries, and Natural Resources,  
University of Eastern Philippines, Northern Samar, Philippines

**Abstract:** The growth response and economic profitability of country pigs raised in different housing were evaluated using the Randomized Complete Block Design (RCBD) with nine weanlings randomly distributed into three treatments. The country pigs were reared in cemented flooring (T1), slatted wood elevated floor (T2), and compacted soil with rice hull (T3) for ninety days (90). The animals were obtained from local backyard hog raisers, and they were subject to feeding trials for ninety days (90). Feeds were mixed based on the weekly consumption of the experimental animals. The Golden kuhol was crushed and sundried for 2 to 3 days. The kangkong stalks were chopped approximately 2-3 centimeters in length. These were mixed well with ground super corn, “Ground 7 kinds Concentrates”, corn grits, rice bran, muscovado sugar, copra meal and ordinary salt. Two to three liters of water were added until the feed was wet before feeding. The country pigs were fed twice a day at six o’clock in the morning and three o’clock in the afternoon at the compounded ration of 800 grams per hog or 2.4 kgs per day per pen. Feeds were increased per week based on the need of the animals throughout the study. Vitamins supplementation was given as needed to the animals. Clean drinking water was made available at all times. Cleaning of pens and animals was done every day, and disinfection of pens was applied every after two weeks. Rice hull used as floor bedding materials was put up and increased every week from the start of the study until its completion. The study revealed that there is a difference in the economic profitability using compacted soil with the rice hull (T3) with the highest Return on Investment rate (ROI) of 29% compared to the slatted wood elevated floor (T2) with ROI of 26% and ground cemented flooring (T1) with ROI of 25%. However, no significant difference was noted in the different treatments on the growth performance of the pigs. Raising country pigs in compacted soil with rice hulls as bedding materials rather than elevated and cemented flooring is more profitable and economical.

**Keywords:** Growth, economic profitability, return on investment, housing

**Received:** 03 December 2018; **Accepted:** 17 January 2019; **Published:** 08 March 2019

### I. INTRODUCTION

In almost every rural household in the Philippines, hog raising is a very popular enterprise such that there is a proliferation of backyard producers, which dominated the swine industry. Other than providing a secondary source of income for small families, hog raising is a fast growing home based business in the Philippines which has the potential for high profits in a relatively short period of time. Raising hog is in demand in the market and

promises a good return of income. However, hog raising is not an ordinary business since it takes a good research and an expert before investing for this kind of business [1, 2, 3]. Pigs grow fast, they grow from about three (3) kilograms at birth to market weight at 50 kilograms in about six (6) months. It takes 10 months from the time the sow conceives until pigs reach the market weight. They can be sold alive at a livestock market or perhaps processed into pork for home use at a local livestock

\*Correspondence concerning this article should be addressed to Eunice Lagrimas Lluz, Chair, Agribusiness and Agricultural Economics Department, College of Agriculture, Fisheries, and Natural Resources, University of Eastern Philippines, Northern Samar, Philippines. E-mail: [eunicelluz@gmail.com](mailto:eunicelluz@gmail.com)

© 2019 The Author(s). Published by KKG Publications. This is an Open Access article distributed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

slaughtering facility. The most important products from hogs are ham, roast or lechon, tocino, bacon and sausage. One of the major concerns in pig production is the housing management. The best way of obtaining a pig house is to provide the pig with house, which can keep them comfortable in various seasons. The best ones are built from either concrete or bricks since one can clean them easily [4, 5]. Under normal condition, pigs are kept in pens in their whole life, thus the pen provides appropriate condition for them. Pig houses must be constructed properly for good health, to obtain maximum performance and save labor cost. When pigs are housed on the ground the flooring should be firmly set on the ground free from organic matters or well tramped gravel or crushed rock fill. Pigs could be raised in concrete floor houses to maximize production efficiency. Likewise they could also be raised on slatted floor to minimize contact of manure to prevent diseases. This study attempted to find out the economic assessment of hog raising in different types of housing.

## II. MATERIALS AND METHOD

### A. Experimental Animals

A total of nine (9) country pigs, domesticated in Northern Samar were used in this study. The animals

were obtained from local backyard hog raisers and they were subject to feeding trials for ninety (90) days.



Fig. 1. Experimental animals for T1



Fig. 2. Experimental animals for T2



Fig. 3. Experimental animals for T3



### B. Experimental Design

The experimental animals were laid out in RCBD. The study was composed of three treatments and repli-

cated thrice. Each animal served as a replicate. The treatments tested were the following: (T1) ground cemented flooring, (T2) slatted wood elevated floor, (T3) compacted soil with rice hull.



Fig. 4. T1 - Ground cemented flooring





Fig. 5. T2 - Slatted wood elevated floor



Fig. 6. T3 - Compacted soil with rice hull

*C. Feed Preparation*

Feeds were mixed based on the weekly consumption of the experimental animals. The Golden Kuhol was crushed and sundried for 2 to 3 days. The Kangkong stalks were chopped approximately 2-3 cm in length. These were mixed well with ground super corn, “Ground

7 Kinds Concentrates”, corn grits, rice bran, muscovado sugar, copra meal and ordinary salt. Two to three liters of water were added until the feed was wet before feeding. These feed ingredients were mixed together based on the availability in the market and affordability by the farmers. Pigs require feed to meet biological needs for maintenance, growth, and reproduction [6].

TABLE 1  
FEED INGREDIENTS

Feed Composition	Quantity kgs.
Golden Kuhol	5
Corn Grits	5
Ground Super Corn	5
Muscovado Sugar	1
Copra Meal	3
Rice Bran	50
Kangkong	2
Ordinary Salt	50 grams
Ground 7 Kinds Concentrate	5

*D. Feeding and Management*

The country pigs were fed twice a day at six o'clock in the morning and three o'clock in the afternoon. Feeds were given in wet basis. The pigs were given the com-

pounded ration at 800 grams per hog or 2.4 kgs per day per pen. Feeds were increased per week based on the need of the animals throughout the study. Vitamin supplementation was given as needed to the animals. Clean

drinking water was made available at all times. Cleaning of pens and animals was done everyday, and disinfection

of pens was applied every after two weeks. Rice hull used as floor bedding materials was put up and increased every one week from the start of the study until its completion.



Fig. 7. Feeding time at 6 o'clock in the morning and 3 o'clock in the afternoon (Treatment 1) ground cemented floor



Fig. 8. Feeding time at 6 o'clock in the morning and 3 o'clock in the afternoon (Treatment 2) Slatted wood elevated floor



Fig. 9. Feeding time at 6 o'clock in the morning and 3 o'clock in the afternoon (Treatment 3) Compacted soil with rice hull

#### E. Housing Requirements

The country pigs were confined at the different treatments, based on the required housing. Each pen was disinfected prior to the conduct of the study and provided with watering and feeding trough. Housing on deep litter or ecological system is favorable for pig production, better quality and great for making ecological pig production widely accepted by family farms. Aside from the pig housing may have better on health conditions of pigs.

#### F. Growth Performance

The average initial weight of the hog was computed at the start of the study and the final weight of the hog at the end of the study. The average weight gain was the difference between final weight and initial weight. To determined the average feed consumption, it was computed by subtracting the left over from the total feeds given for the whole study period. The feed cost should be reduced through the process by substituting feed with

locally available product [7]. Average feed conversion ration, this was the total feed consumed divided by the

gain in weight per hog. This represent the amount of feeds needed to convert a kilogram live weight.



Fig. 10. Weighing of the Hog at the start of the study



Fig. 11. Weighing of the Hog at the end of the study



Fig. 12. Weighing of the Hog to get the final weight



$$ROI = \frac{\text{Net Income}}{\text{Total Investment}} \times 100$$

The ROI, was used to measure the economic profitability of the country pigs raised in the different types of housing.

ROI increased gradually as the herd size increase [8].

#### G. Data Analysis

All data gathered on the growth performance were computed and interpreted using Analysis of Variance (ANOVA).

### III. RESULTS AND DISCUSSION

Although in this experiment, three (3) pigs were used per treatment the study revealed that there is difference on the effect on economic profitability of using compacted soil with rice hull (T3) with the highest ROI rate of 29% compared to ground cemented flooring, (T2) with ROI of 26% and slatted wood elevated floor (T1) with 25%. The revenue generated from the sales of pigs would increase as the production experience and herd size increase.

TABLE 2  
THE PERCENT ON RETURN ON INVESTMENT OF COUNTRY PIGS AT DIFFERENT TYPES OF HOUSING

Treatment	% ROI
T1	25
T2	26
T3	29

This could be interpreted that for every PhP 1.0, one peso of investment capital it generated a net income of PhP 0.25, PhP 0.26 and PhP 0.29 for ground cemented flooring, slatted wood elevated floor and compacted soil with rice hull, respectively. This ratio is used to gauge the assessment in the efficiency in managing the total assets investment.

#### A. Growth Response

The initial weight of weanling country pigs in kilogram is presented in Table 3. The data show that treatment 2 (T2) had the highest weight of 27.7 kg. followed by treatment 3 (T3), 25.6 kg. and lastly, treatment 1 (T1), 23.8 kg. No significant difference was noted on different treatment means.

TABLE 5  
AVERAGE GAIN IN WEIGHT, AND AVERAGE DAILY GAIN OF COUNTRY PIGS

Treatment	Average gain in Weight (AGW) kg	Average daily gain (ADG) grams
T1	20.43	0.410
T2	21.63	0.525
T3	22.73	0.540

#### B. Feed Consumption

Table 6 presents the average feed consumption of country pigs. The result of the study showed that feed consumption was given in restricted basis. Feeding pigs

TABLE 3  
INITIAL WEIGHT OF COUNTRY PIGS IN KILOGRAM AT THE START OF THE STUDY

Treatment	Mean weight kg
T1	23.8
T2	27.7
T3	25.6

The average final weight of the experimented animals is presented in Table 4. The data revealed that during the ninety (90) days feeding, the pig in T3 confined in a compacted soil with rice hull had heavier weight with 48.37 kg followed by the pigs confined in slatted wood flooring with 47.33 kg. The pigs in Treatment 1 ground cemented flooring had the lowest weight 44.40 kg. The result of ANOVA for RCBD showed that the final weight of the country pigs among the final treatments did not differ significantly.

TABLE 4  
FINAL WEIGHT OF COUNTRY PIGS IN NINETY DAYS

Treatment	Mean weight kg
T1	44.23
T2	47.33
T3	48.37

The data on gain in weight and average daily gain of country pigs are presented in Table 5. The data shows that those weaners in Treatment 3 gained more in weight of 22.73 kilograms or 0.540 grams daily gain in weight, followed by Treatment 2. It had 21.63 kilograms or 0.525 grams average daily gain, and lastly, pigs in Treatment 1 were 20.43 kilograms or 0.410 grams gain in weight. Based on the result of RCBD analysis it was found out that no significant difference was noted among the three treatments studied.

for optimum production require that feed stuffs be combined in proportionate amount that will produce the quantities of nutrient needed by the animals [9]. However, statistical analysis revealed that there were no significant

differences among the three treatments studied.

TABLE 6  
FEED CONSUMPTION OF COUNTRY PIGS

Treatment	Mean
T1	74.00
T2	67.20
T3	59.20

### C. Feed Conversion Ratio

The result of feed conversion ratio per pig is presented in Table 7. It shows that Treatment 3 (T3) pigs confined in compacted soil with rice hull required lesser quantity of feeds with 2.58 kilogram for 1 kilogram live weight. It also showed best converted among treatment means. Followed by Treatment 2 (T2) which required 3.13 kilograms of feed to produce a kilograms live weight, while Treatment 1 (T1) ground cemented flooring showed the highest amount of Feed 3.63 kilograms to produce a kilogram live weight. The data implies that pigs in compacted soil with rice hull (T3) were efficient feed converter compared to other treatment. Feed Conversion Ratio (FCR), which defines the feed requirement in kg per kg bodyweight gain, is an important measure for judging the economical and breeding performance of a fattening pig [10, 11]. Based on the statistical analysis, the FCR of the pigs showed no significant differences among the different floor types.

TABLE 7  
FEED CONVERSION RATIO OF COUNTRY PIGS

Treatment	Mean FCR
T1	3.63
T2	3.13
T3	2.58

## IV. CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

Growth response of country pigs raised in compacted soil with rice hull is more economical and profitable in ninety (90) days of study. The country pigs raised in three different flooring system have no significant differences as noted in the three parameters tested. This implies that country pig raisers can use any of these types of flooring system. Hog raising focuses on housing facilities feeding and ventilation systems, temperature and environmental controls and economic viability of their operations [12, 13].

Based on the findings of the study, the following recommendations were made: raising country pigs in a compacted soil with rice hull as bedding material rather than elevated and cemented flooring is more profitable and economical, a similar study should be conducted, focused on different stages of hogs from farrowing, suckling to finisher stage house on different flooring system.

## REFERENCES

- [1] B. S. (2010) Ammonia and livestock farming scheme. [Online]. Available: <https://bit.ly/2WhCb8E>
- [2] H. Ozyürek and Y. Uluturk, "Flexible budgeting under time-driven activity based cost as a tool in management accounting: Application in educational institution," *Journal of Administrative and Business Studies*, vol. 2, no. 2, pp. 64–70, 2016. doi: <https://doi.org/10.20474/jabs-2.2.2>
- [3] B. R. Anjani and I. Baihaqi, "Comparative analysis of financial Production Sharing Contract (PSC) cost recovery with PSC gross split: Case study in one of the contractor SKK migas," *Journal of Administrative and Business Studies*, vol. 4, no. 2, pp. 65–80, 2018. doi: <https://doi.org/10.20474/jabs-4.2.2>
- [4] P. Barry, P. Ellinger, J. Hopkin, and C. Baker, *Financial Management in Agriculture*. New Jersey, NJ: Pearson Education, Inc, 2012.
- [5] B. Omar and L. Khamsa, "The impact of cultural values on the performance of small and medium-enterprises (case study of managers in Bechar, Algeria)," *International Journal of Business and Administrative Studies*, vol. 3, no. 6, pp. 217–228, 2017. doi: <https://doi.org/10.20469/ijbas.3.10003-6>
- [6] J. A. Eusebio, *Pig Production in the Tropics*. Harlow, Essex: Longman Group, 1980.
- [7] Ezcibe, "Center for entrepreneurship and development research," Unpublished thesis, University of Nigeria Nsukka, Nsukka, Nigeria, 2009.
- [8] A. E. Obayelu, O. O. Ogunmola, and O. K. Sowande, "Economic analysis and the determinants of pig production in Ogun State, Nigeria," *Agricultura Tropica et Subtropica*, vol. 50, no. 2, pp. 61–70, 2017. doi: <https://doi.org/10.1515/ats-2017-0007>
- [9] A. Komolafe, A. Adegbola, L. Are, and I. Ashaya, *Agricultural Science for West African Schools*. Ibadan, Nigeria: Oxford University Press, 1978.
- [10] C. Wenk, H. Pfirter, and H. Bickel, "Energetic aspects of feed conversion in growing pigs," *Livestock Production Science*, vol. 7, no. 5, pp. 483–495, 1980. doi: [https://doi.org/10.1016/0301-6226\(80\)90086-x](https://doi.org/10.1016/0301-6226(80)90086-x)

- [11] Anonymous, "Scientists' assessment of the impact of housing and management on animal welfare," *Journal of Applied Animal Welfare Science*, vol. 4, no. 1, pp. 3–52, 2001. doi: [https://doi.org/10.1207/s15327604jaws0401\\_2](https://doi.org/10.1207/s15327604jaws0401_2)
- [12] M. Thomassen, M. Dolman, K. Van Calker, I. De Boer *et al.*, "Relating life cycle assessment indicators to gross value added for dutch dairy farms," *Ecological Economics*, vol. 68, no. 8/9, pp. 2278–2284, 2009. doi: <https://doi.org/10.1016/j.ecolecon.2009.02.011>
- [13] T. Hertz, T. Jayasundera, P. Piraino, S. Selcuk, N. Smith, and A. Verashchagina, "The inheritance of educational inequality: International comparisons and fifty-year trends," *The BE Journal of Economic Analysis & Policy*, vol. 7, no. 2, pp. 1–46, 2007. doi: <https://doi.org/10.2202/1935-1682.1775>