

Performance of Indigenous Pigs of Upland and Lowland Irian Jaya

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ABSTRACT: The study using 40 pigs was carried on to determine the productive performance found that the daily gain and the feed conversion of indigenous pigs in Irian Jaya were very low. The reproductive performance of the pigs studied through a survey was moderate. Most of the sows bred naturally at the age of 7 to 7.5 months and the litter size at first farrowing varied from 4 to 9

piglets. The management practices done by the farmers was mostly traditional influenced by the life style and the culture. The prominent qualitative morphological traits between the upland pigs and the lowland pigs was similar. However, some of the quantitative morphological traits were different between Irian Jaya upland's pigs and Irian Jaya lowland's pigs.

Key Words: Indigenous Pigs, Production, Reproduction, Morphology, Management, Irian Jaya

Introduction

The existence of indigenous pigs for the native tribes in Irian Jaya is very important. The primary roles of the indigenous pigs are mainly integrated with the daily life of the inhabitants. Pigs, for instance, are raised purposely for payment of fine or dowry rather than for food. Pigs, also, serve as sacrificial animals in several traditional activities such as rituals or festivals.

By contrast, in raising the animals, the tribes still practice the traditional way. They just let the animals stray around the backyard looking for food. Even though, some people feed the animals and provide a proper housing.

The indigenous pigs of Irian Jaya, up to now, is one of the natural resources existing especially for the village areas. However, data on the productive and the reproductive performance as well as the morphological trait of the pigs in Irian Jaya describing their potential local resources are lacking.

Therefore, this study looked into the actual potency through the productive and the reproductive performance of the indigenous pigs both in the upland and the lowland areas of Irian Jaya. The study provided some baseline information that will be helpful to animal breeders to improve the productivity of the pigs, by which it may be more beneficial for the village farmers. The information may also be useful to agricultural government officials in planning technical intervention in community development programs to assist the rural

people of Irian Jaya get better quality of life.

Materials and Methods

Study I: Productive Performance

General. This study was conducted for six months, from April to October 1993 in Manokwari using Amban village as upland area and the coastal area of Borasi and Wirsi village as lowland area.

Forty indigenous weanling pigs were used in this study. Twenty pigs, 10 males and 10 females were randomly selected in the lowland area. Those pigs were randomly distributed to the farmers in both areas with two pigs - one female and one male - per farmer. The farmers were the cooperators in raising the pigs using the standard management practices prevalent in their own localities.

Farmer-cooperators were selected based on their length of experience in pig raising and the number of pigs they have already raised.

The animals were individually penned and fed. The pigs were weighed monthly. The feed given to the animals and the left over were likewise weighed. The sample of feed given and the left over was sun dried for three to four days to determine water content. The percentage of water content was used to convert the amount of feed consumption in wet basis to dry basis. The kinds of feeds were checked also before feeding.

Daily morning visits to the cooperators and the pigs were done for the whole duration of the study.

Two farmer-cooperators in each area were trained to look after the experiment when the proponent was not around.

Upland pens treatment. The average size of pens in upland was 1.31 m x 0.99 m. Materials used for the pens were wood and board. The pens were constructed in the backyard, 4 to 7 m away from the farmer's house. Some of the pens were constructed with roofing made of galvanized iron.

Lowland pens treatment. The average size of the pens used in this experiment was 1.23 m x 0.89 m. Materials used for the pens were wood, board, and bamboo. All pens were constructed close to the beach and at the side of the house.

Upland feeding treatment. The feeds given to the pigs were cassava, taro, kangkong, salted fish, cabbage, amaranth, papaya (fruit and leaves), sago, grated coconut, and sweet potato. The feed was given *ad libitum* and in wet form. Two cooperators fed the pigs once a day, and the rest cooperators fed the pigs twice a day.

Lowland feeding treatment. The animals were fed *ad libitum* with kitchen refuse, cassava, taro (leaves, stem, and roots), kangkong, grated coconut, rice, and salted fish. The sources of feeds were kitchens, markets, restaurants, and hospitals. The feed was provided in wet form. Two cooperators fed the animals once; five cooperators, twice; and three cooperators, three times a day.

Statistical analysis. Descriptives analysis and the t-test analysis were done to document the productive performance of the pigs and to analyze the results of the experiment.

Study II: Reproductive Performance, Management Practice, and Morphological study

General. This study was conducted through a survey for three months from June to September 1993. In the survey, 31 villages (12 villages located in the lowland area and 19 villages located in upland area) were selected from 5 districts in Irian Jaya; namely, Manokwari, Biak-Numfor, Paniai, Jayapura and Jayawijaya.

There were 110 farmers of the lowland area (Manokwari, 52; Jayapura, 20; and Biak-Numfor,

38) and 141 farmers of the upland area (Wamena (Jayawijaya), 45; Nabire, 40; Anggi (Manokwari), 39; and Sentani (Jayapura), 17). Those farmers were interviewed using a questionnaire.

In terms of morphological study, 351 indigenous pigs of lowland areas, and 454 indigenous pigs of upland area were selected. The animals were characterized by hair color, coat pattern, head shape, body shape, tail shape, and pastern.

To measure the quantitative traits such as body length (BL), heart girth (HG), height at withers (HW), and face length (FL), 68 pigs were selected for upland, and 52 pigs for lowland. All selected pigs were grouped based on the body weight.

Statistical analysis. Data on the reproductive performance and morphological traits of indigenous pigs and management practices gathered during the survey were described using descriptive analysis. However, to test the mean of the quantitative traits data, t-test was applied.

Results and Discussions

Productive Performance

Body weight and daily weight gain

The results of the monthly body weight of the indigenous pigs of upland and lowland areas are shown in Table 1.

The initial body weight of the indigenous pigs in the upland and in the lowland areas was not significantly different. However, after the initial period or from the first month to the end of the study, the average monthly body weight of the lowland pigs, except in the first month, was significantly higher than that of upland pigs.

Compared to the body weight of indigenous pigs studied in Papua New Guinea (PNG), the body weight of upland and lowland pigs in Irian Jaya was lower. According to Malynicz (1973), the average body weight of native pigs in PNG at the age of about 5.5 months was 20.5 kg. In Irian Jaya, however, the body weights of the pigs at about 6 months were less than 15 kg. Furthermore, if compared to the Yorkshire which reached 60 kg at about 5 months of age (Saseendran and Rajagopalan, 1982), the growth rate of indigenous pigs in Irian Jaya was very low.

Table 1. The monthly body weight of the indigenous pigs in upland and lowland Irian Jaya

Weighing Period ^a	Upland (kg)	Lowland (kg)	Difference ^b (kg)
Wo	6.85	6.81	0.04 ^{ns}
W1	9.33	10.02	-0.69 ^{ns}
W2	11.90	12.95	-1.05 [*]
W3	14.37	15.76	-1.39 ^{**}
W4	17.04	18.60	-1.56 ^{**}
W5	19.93	21.69	-1.76 [*]

^aWo=initial weight; W1,W2,W3,W4,W5=weight at 1st, 2nd,3rd,4th,5th month of the study

^b**=significant at 1% level, *=significant at 5% level,

^{ns}=not significant

Table 2. The daily gain of the indigenous pigs in upland and lowland Irian Jaya

Months	Upland (kg)	Lowland (kg)	Difference ^a (kg)
1	0.083	0.107	-0.024 ^{**}
2	0.086	0.098	-0.012 ^{ns}
3	0.082	0.094	-0.012 ^{ns}
4	0.089	0.095	-0.014 ^{ns}
5	0.097	0.103	-0.002 ^{ns}
Mean	0.087	0.099	-0.012 [*]

^a**=significant at 1% level, *=significant at 5% level,

^{ns}=not significant

As shown in Table 2, the average daily gain (ADG) of lowland pigs was significantly higher than the ADG of upland pigs. The highest ADG of the pigs in lowland was obtained in the first month; while in upland, it was at the fifth month of the study.

The better growth of lowland pigs was more or less caused by the better feed they consumed. Compared to the upland pigs, the lowland pigs which were mostly provided with the restaurant left-over and waste of fish that contained some protein and other essential nutrients were getting more opportunity for growing better.

In addition, the introduction of some high breed pigs such as Yorkshire, Dutch Landrace, and

Chinese Pigs by the Netherlands Government during the time they ruled in Irian Jaya about 40 years ago had contributed to the good genetical potency for the lowland pigs (Hoekstra and Kraneveld, 1955).

Feed consumption and feed conversion

The average daily feed consumption (dry basis) of the indigenous pigs of upland and lowland Irian Jaya is presented in Table 3.

The average daily feed consumption of upland pigs was significantly higher than that of lowland pigs.

In terms of feed conversion (Table 4), both the indigenous pigs in upland and in lowland were very

Table 3. Average daily feed consumption of the indigenous pigs in upland and lowland Irian Jaya

Months	Upland (kg)	Lowland (kg)	Difference ^a (kg)
1	2.32	2.29	0.03 ^{ns}
2	2.65	2.58	0.07 ^{ns}
3	3.05	2.70	0.35 ^{**}
4	3.27	3.01	0.26 ^{**}
5	3.43	3.27	0.16 ^{ns}
Mean	2.94	2.77	0.17 [*]

^{a**}=significant at 1% level, ^{*}=significant at 5% level, ^{ns}=not significant

Table 4. Average of feed conversion of the indigenous pigs in upland and lowland Irian Jaya

Months	Upland (kg)	Lowland (kg)	Difference ^a (kg)
1	31.85	23.31	8.54 [*]
2	34.01	28.30	5.71 [*]
3	39.98	29.63	10.35 ^{**}
4	42.04	33.88	8.16 ^{ns}
5	37.15	33.58	3.57 ^{ns}
Mean	37.01	29.74	7.27 ^{**}

^{a**}=significant at 1% level, ^{*}=significant at 5% level, ^{ns}=not significant

inefficient in converting the feed to the growth rate. In spite of the inefficient of feed conversion, the pigs in lowland were significantly better as a converter than the pigs in upland.

The feed conversion of the pigs in upland and lowland Irian Jaya was very different from what Lekule, et al (1980) found in Africa's indigenous pigs or what De Abba (1972) observed in Latin America's pigs. In Africa, the feed conversion was 3.78, and in Latin America, it was 5.3.

Based on the study done in Africa and in Latin America, there is still a possibility to improve the productivity of the indigenous pigs in Irian Jaya, either through genetical aspects or management practices.

Recently, therefore, the provincial office of Animal Husbandry in Jayapura has started introducing some high breed pigs which came from

outside Irian Jaya, like Sumatra and even from PNG. The high breed pigs which has been introduced already were Yorkshire from Sumatra, and Duroc from PNG. The main purpose of the program that just started in January 1993, was to distribute the pre-started pigs to farmers in Irian Jaya either to raise them only or to keep them as a breeding stock which will be crossed with the farmer's own native pigs.

Reproductive performance

Most of the indigenous pigs in Irian Jaya that reached maturity were bred naturally. The pigs in upland as well as in lowland were bred for the first time at the age of 7 to 7.5 months. However, most of gilts farrowed in the range of age 13 to 13.5 months.

At the first farrowing, the most litter size in upland pigs was varied from four to six piglets; while in lowland, it was seven to nine piglets.

The most common weaning age of the piglets either in upland or in lowland Irian Jaya was three months, and with the litter size at weaning was four to six piglets.

General management practices

The findings during the survey on the methods practiced by the farmer-respondents in raising their pigs showed that most of the respondents both in lowland and in upland raised their pigs using semi-confined system.

In taking care of the pigs, either in lowland or in upland, wives were the most responsible as caretakers. They were responsible for securing and preparing feeds. Husbands, on the other hand, were responsible for building sties and sometimes just for monitoring the animals.

Most of the respondents in lowland and in upland practiced castration to the pigs. The purposes were to accelerate and to stimulate the growth of the pigs, to avoid breeding the neighbor's sows, and to reduce a wild nature of the pigs.

The other common practices applied by the respondents, especially in upland, were cutting of ears and tails. Aside for identification, the respondents believed that with the cut of tails the pigs would grow faster or to be healed.

Feeds and feeding

Feeds were prepared in several ways either in upland or in lowland such as cooking (boiling), roasting, and soaking. It was common also to give the pigs with raw materials. In lowland, a majority of the respondents prepared the feed by cooking or boiling, while in upland, most respondents just fed their pigs with raw feed.

Using sweet potato as an outstanding single feed by the majority of the farmer-respondents in upland has been a problem. The sweet potato is also staple food for the inhabitants. However in lowland areas, the farmers used already a combination of local feed such as cassava (leaves and roots), taro (leaves, stalks, and roots), papaya, kangkong, cowpea, scraped coconut, fish waste and chicken refuse.

Housing

In providing a house or a special place for the pigs, it was vary in upland areas from one district to

another district. However, in lowland, most farmers built an elevated house which was constructed roughly and simply.

In Anggi (the upland area located in Manokwari district), the farmers confined their pigs in an open field where they set up a fence surrounding it, like a ranch. The area was about one to three ha. Actually, this area was used a farm that had been cultivated. The farmers just abandoned it for a particular time and shifted to other field. About five to seven farmers shared together one ranch where they kept 20 to 30 adult pigs.

The farmers in Wamena (the upland area located in Jayawijaya district), on the other hand, have provided a special housing for the pigs. The pig's housing was a part which cannot be separated from the housing system of the people. The pig's housing, kitchen, and the farmer's housing which there is a male housing separated with several female housing, are the unit of a residence system of one family. The pig's housing was constructed with using grasses as a roofing and wood-board as a wall which was arranged tightly. Built a pig's housing in such a way to overcome the cold temperature in Wamena.

Morphological characteristics

The prominent traits such as coat color, coat pattern, body shape, face shape, snout length, ears shape and tail shape of the indigenous pigs either in upland or in lowland were similar.

The most dominant hair color of the surveyed indigenous pigs in upland and lowland Irian Jaya was black. This fact is similar to what was observed by Francisco (1992) in the Philippines, and Falvey (1981) in Thailand.

Aside of a solid pattern of the coat, the white band pattern from mouth to jaw angle was most found in lowland areas. It was a certain traits that Groves (1981) used to classify some of native pigs in Indonesia as a species of *Sus scrofa*.

As indicated in Table 5, the body length (BL) of lowland pigs was significantly longer than the BL of upland pigs in each class of body weight, except in the class of 25 to 34.9 kg which is not significant. However, the heart girth (HG) of the pigs in upland was larger than that of lowland.

Table 6 indicates that the average height at withers (HW) of lowland pigs was very significant higher than that of upland pigs in every class of body weight, except in class of 25 to 34.9 kg, it is not significant. The table also shows that the

Table 5. Average body length (BL) and heart girth (HG) of surveyed indigenous pigs in upland and lowland Irian Jaya

Class of Body Weight (kg)	Body Length (cm)			Heart Girth (cm)		
	U	L	D	U	L	D
5 - 14.9	47.95	52.71	-4.76**	50.05	49.59	0.46 ^{ns}
15 - 24.9	62.70	64.81	-2.11*	66.65	63.75	2.90 ^{ns}
25 - 34.9	70.31	71.73	-1.42 ^{ns}	80.75	70.64	10.11**
35 - 45.0	74.90	77.00	-2.10*	85.80	77.75	8.05**

U = Upland L = lowland D = Difference

** = significant at 1% level, * = significant at 5% level,

^{ns} = not significant

Table 6. Average height at withers (HW) and face length (FL) of surveyed indigenous pigs in upland and lowland Irian Jaya

Class of Body Weight (kg)	Height at Withers (cm)			Face Length (cm)		
	U	L	D	U	L	D
5 - 14.9	28.68	32.35	-3.85**	17.77	19.38	-1.61**
15 - 24.9	35.85	38.13	-2.28**	20.85	23.81	-2.96**
25 - 34.9	38.88	40.00	-1.12 ^{ns}	24.44	25.91	-1.47**
35 - 45.0	40.10	43.88	-3.78**	27.20	28.75	-1.55*

U = Upland, L = lowland, D = Difference

** = significant at 1% level, * = significant at 5% level,

^{ns} = not significant

indigenous pigs surveyed in lowland areas have a face length (FL) longer than the FL of the upland pigs.

Conclusions and Recommendations

The indigenous pigs of the upland and the lowland areas in Irian Jaya were very slow growers and inefficient feed converters. However, in productive performance, the lowland pigs were slightly better than the upland pigs.

The reproductive performance was rather moderate, either in the upland or in lowland areas.

The management practices used in both areas were generally very simple and varied from one place to another based on the life style or the culture of the farmers.

The morphological traits, particularly based on prominent qualitative traits, were the same between

the indigenous pigs in upland and that in lowland.

The recommendations that should be given related to the study are: a research on alternative feeds, which are not only good for the animals but also not competitive with the people; an action research in community development using the agricultural- anthropological approach on a specific areas to get more information about the cultural reasons behind the traditional practices of raising the pigs; a study on chromosomal polymorphism to determine the genetic variation; and providing a short training to the extension workers to improve their role in assisting the farmers to get more skill in raising pigs.

Literature Cited

De Abba, J. 1972. Productivity of native and exotic pig breeds in Latin America. World Anim. Rev. (4):25.

- Falvey, L. 1981. Research on native pigs in Thailand. *World Anim. Rev.*(38):16.
- Francisco, C.C. 1992. Farmers's management practices and the morphological and genetic characteristics of native pigs in six southern Luzon provinces. M.S.Thesis, UPLB, Philippines.
- Groves, C. 1981. Ancestors for the pigs: taxonomy and phylogeny of the genus *Sus*. Technical Bulletin No.3. Department of Prehistory, Research School of Pacific Studies, Australian National University, Australia.
- Hoekstra, P. and F.C. Kraneveld. 1955. Veeteeltkundig en dier ziektetekundig onderzoek in Nederlands Nieuw-Guinea. Rapport. The Territory of Papua and New Guinea.
- Lekule, F.P., S.V.Sarwatt and G.C.Kifaro. 1990. The role performance and potential of indigenous local pigs in developing countries. *TSAP Proceedings*, vol. 17:79.
- Malynicz, G.I. 1973. The productivity of exotic and indigenous pigs under village conditions - part I & II. *Papua New Guinea Agricultural Journal*, vol.24(1):16.
- Saseendran, P.C. and T.G.Rajagopalan. 1982. Note on the potentialities of indigenous and exotic pigs. *Indian J.Anim.Sci.*,51(10):1003.