



Working with Ethnic Group: A Case Study of Introducing Pig Fattening to Garay Ethnicity in Ouyadav District, Ratanakiri Province

PHEM MENGHAK*

*Royal University of Agriculture, Phnom Penh, Cambodia
Email: menghak44@yahoo.com*

THIM SOKHA

Royal University of Agriculture, Phnom Penh, Cambodia

THENG KOUCH

Royal University of Agriculture, Phnom Penh, Cambodia

SENG MOM

Royal University of Agriculture, Phnom Penh, Cambodia

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Abstract Ratanakiri is remotely located in northeast of Cambodia about 600 km from Phnom Penh. Pig production of Garay ethnicity was challenged with poor feeding and high risk of mortality. The study aimed to compare the effect of feed supplement, estimate the economic efficiency, and study the adoption of target group to the demonstrated experiment pig fattening. A group discussion was launched to select 5 volunteer farmers from each village who met the criteria. The chosen farmers were trained on pig fattening process. Each of them had been subsidized two piglets; hand in hand pen construction, and feed supplements for 4 months. Some information was informally interviewed to understand the current feeding and management; and determine the suitable interventions. Farmers were then randomly allocated into two treatments, viz. T0 (Control group – free range feeding) and T1 (Supplement group – 40% concentrates, 30% rice bran, 30% cassava chip). The growth rate was recorded every 2 weeks for 4 months. After a 7-month period, all adopted farmers were interviewed by using questionnaire for impact study. The results have shown significant 3-fold improvement in daily average weight gain of improved diet group although the economic efficiency of the two groups did not differ. After seven months of interventions on the ground, some changes were observed. For example, 80% of the selected farmers kept pigs in pens regularly and started to utilize local available feeds. Thirty percent was willing to buy commercial feeds. All management tasks were done 50%, 40%, 10% by wives, husbands, and children, respectively. Vaccination was not totally implemented by them. We concluded that our interventions have changed some behaviors of focused farmers and neighbors on the production in terms of management practices and feeding for pig fattening. More feeding options need to be assessed for better economic efficiencies.

Keywords fattening pig production, productivity, intervention, Garay ethnicity

INTRODUCTION

Ratanakiri province is located in the northeast of Cambodia. It borders with Laos PDR to the west and Vietnam to the east. The province is located about 600 km from Phnom Penh and the average annual temperature is in the range of 26-31 °C. Ethnic Group was the main target of the study; there is Garay ethnicity contributing totally 98% of population in Ka Te and Samkaninh villages of Lumchor and Soam Thom communities, respectively belonging to Ouyadav district selected as studied area. The main jobs of villagers are cassava and rice cropping, animal husbandry (more

noted as local breeds), as well as forestry such as hunter and labor work (RPDA, 2010). In Cambodia, pig raising is one of the sources of income for farmers through selling of pigs, pork, and processed pork, which are good sources of protein (Sorn, 2011). 92.81% of Pig production was conducted by smallholder in 2010 and this percentage decreased to 84.87% in 2013 due to rising of disease outbreak and low profit when selling to the market (DAHP, 2013). In general, small scale animal production depends on locally available feed resources such as rice bran, broken rice, sugar cane tops, sweet potato vines, cassava roots, and kitchen waste; while commercial feeds are rarely used due to high cost. The proportion of commercial feed used is about 20 % of pig smallholder, while the remaining 80 % depends on mainly crop residues and farm by-products, which are often poor quality and low nutritional value (Khieu et al., 1996). Biosecurity is defined as the implementation of creation the barrier to prevent most contamination and infection by segregation, cleaning, and disinfectant; the practices depend on production system concerned, the local geographic and socio-economic (FAO & OIE, 2010). However in Ratanakiri, the pigs of the ethnic group are freely raised, challenging poor feeding, no deworming and vaccination programs; resulting to high risk of diseases and mortality. In addition, due to land converting from forestry-covered to agro-industry land such as rubber farm, cassava, and so on; less scavenging areas are available. This leads farmers to hesitate to increase number of pigs, or even continue their raising. The introduction of pig fattening by concentrating diet supplemented to local basal diet, and proper management and bio-security (pig housing, deworming, and vaccination) by farmers would be a solution to overcome the constraints; while pig production performance and farmers' income would be improved. The farmtrials in this paper employ hypothesis testing and lessonlearn methods to study the adoption of new techniques of participating famers and neighboring ones.

OBJECTIVES

The study aimed to compare the effect of feed supplements, estimate the economic efficiency, and study the adoption of the target ethnic group to new techniques of the demonstrated experiment of pig fattening.

METHODOLOGY

There are 2 steps in this study: the first is to select the focused group and set up a trial of pig fattening, and the second is evaluation of farmer adoption.

Farmer Selection

Ka Te and Samkaninh villages were selected as the studied areas based on the ethnic resident that is 98% of Garay group. The discussions were conducted with local authority about farmers' situation in the selected villages. Farmer meetings were set up to introduce the project purposes and activities in each village. The selection of volunteer farmers to join the project was done during the meetings. Then, all willing farmers' houses were visited to observe their resources. The criteria of selecting the farmers were as follows: be ethnic group, willing to work, have available labors and house-area for constructing the pig pen, and grow some vegetables for the pigs. The household heads that were women, widows, and disable people were also encouraged to participate. After all criteria were met, the selected farmers were trained on fattening pig production, breed and breed selection, feed and feeding, housing, and bio-security.

Experimental Design

The selected farmers were assigned into 2 treatments as shown in Table 2, with five replications (farmers), and two piglets were distributed to each farmer. The two treatments were: T0: control group by supplementing rice bran and T1: supplement group: supplementing concentrates at 40% with cassava chip 30%, and rice bran 30%, mixed with farmer's basal diet.

Table 1 Feed supplementation

Group	T0 (Control)		T1 (Supplement)	
	Jul-Aug	Sep-Oct	Jul-Aug	Sep-Oct
Duration				
Quantity for 2 piglets (kg/day)	0.4	0.5	0.8	1.0
Piglets (heads)	10		10	
Crude Protein (%)	9.5 %		20.5 %	

Piglet Housing and Distribution

After completed the training course, pig pens were constructed by full participation from farmers to improve their understanding about pig pen. The method was learning by doing as they had no experience to construct the pen before. The pen size was 2 meters in width and 3.5 meters in length with concrete floor, iron sheet roof, and wooden barred to protect the piglets out. Twenty local breed piglets of three months old were bought from nearby villages, and then they were randomly distributed to volunteer farmers. The initial piglet-weight in both groups was non-significant as: T0 was 6.39 ± 0.38 kg and T1 was 6.41 ± 0.36 kg.

Feed and Feeding for Pig Fattening

Concentrate feed was used as a part of supplement diet to show farmers how much feed rich-protein could improve the growth performance of their pigs. The basal diet of both groups was based on locally available feed resources such as taro stem, banana stalk, sweet potato vines, pumpkin, papaya and vegetables. Feeds for supplement of both groups were packed for 1-time feeding to be mixed with basal diet.

Management and Bio-security

In order to introduce the farmers, some parts of bio-security were implemented; the pens were disinfectant by applying commercial calcium bicarbonate, cleaned by boiled water 100°C after 1-day period, and piglets were kept in individual pens with drinking nipples. All the pigs were vaccinated against hog cholera disease, treated with an anti-parasitic drug (Ivomic given by injection) at the first week of keeping and beyond after one month next. Pigs were fed 2-3 times per day depending on available time of the farmers.

Table 2 Vaccination

Date	Piglet Age	Vaccine name	Disease	Usage
27/07/2013	3 months	Pest Porcine	Hog Cholera	Muscle injection
27/08/2013	4 months	Pest Porcine	Hog Cholera	Muscle injection

Data Collection and Analysis

The piglets were weighed every two weeks in the morning before feeding. Feed supplementary and feed refusals were daily recorded. All data were recorded using Microsoft Office excel 2010. The study of farmers' adoption was conducted by questionnaire 3 months after the experiment finished. In every 2 weeks, growth performance deviation was analyzed by using Independent Sample T-test Statistics of SPSS version 18. The adoption data from the questionnaire was analyzed by Microsoft Excel to calculate the descriptive statistics and to design graphic.

Chemical Analysis

Samples of feed supplement—concentrated feed, rice bran, cassava chips, were collected from the area of study and analyzed for Dry matter (DM) and Nitrogen (N), according to Undersander et al. (1993) and AOAC (1990), respectively.