

Chapter 1
Introduction

In most Asian countries, livestock is an integral part of farming systems practices. Pigs in particular are an important small animal species used in mixed farming systems in southeast Asia. They provide a good source of insurance and investment stock that can be readily converted into cash. On small farms in particular, pig-raising efficiently utilizes crop surplus and household waste, and can contribute to crop production through manure, while bringing additional cash to the farm enterprise. Furthermore, pigs fulfill various needs of human beings, by providing a high quality source of nutrients.

Pig-raising is especially prevalent on small rather than large farms, where few numbers of pigs are kept at a time. A survey of pig production in Guatemala by Paladines (1988) illustrated that of a total of 1,582 pig farms, 73 percent were classified as small and contained fewer than 9 fattening pigs. Similarly, data from Chile showed that 51 percent of the national pig herd was found on farms with fewer than 10 fattening pigs (Paladines 1988).

At this time, overall pig productivity in the tropics is considerably lower than in temperate areas (De Vacarro, 1988). Major factors often cited as limiting animal productivity in the tropics include the direct and indirect effects of climate, nutrition and health care, the genetic quality, management skills, and the availability of credit and marketing facilities (Nestel, 1975).

In Thailand, the degree to which physical factors such as climate can affect pig production is also related to the scale of the production system. Normally, large or commercially oriented swine operations can minimize climatic variations through well-equipped housing. However, in the backyard or traditional raising systems, climatic factors such as temperature, wind, and rain tend to be strong and less easily controlled. The result can be poor pig health and slower growth. Indirect climatic effects can also be stronger in traditional systems. Parasites and mosquitoes during the rainy season have easy access to pigs, slowing pig development more. Furthermore, drought or flooding can reduce crop yields and crop by-products, which many traditional systems rely on for animal feed. Commercial operations, on the other hand, may buy processed dry foods, and can more easily absorb extra costs into their system.

Nutrition and health care are well-known to be two of the most important factors in pig production, and perhaps the most critical ones which farmers can manipulate by themselves. Pig feeding in the backyard system is based on the availability of yearly feedstuffs, such as rice bran, broken rice, or other crop by-products. Again, factors which affect crop yield may also affect pig nutrition and development. Important sanitation measures include cleaning the pigs and pig-sties regularly, and contacting extension agents for vaccinations. Contact with the latter may vary, especially for backyard raisers with only one or two animals, or in villages far from the district office.

A related variable of great importance in pig production success is the farmer. Various surveys of family production systems have indicated a wide range of education, knowledge, and managerial skill (Brannon et al. 1983). Management is influenced by the cultural attitudes of the community in which the farmer lives, his or her educational level and degree of skill, in addition to previous experience, and the advice and support from extension service officers. Cultural attitudes are especially significant in livestock production. In many parts of the tropical world larger livestock such as cattle, water buffaloes, and sometimes even pigs, are raised not only for

economic motives, but also for prestige and to fulfill social obligations. These animals are used as in a variety of community and family ceremonies such as birth, death and marriage, or else as a convenient way of dividing and inheriting property (Devendra 1988, Farming Systems Research Project 1984, Nestel 1975). Attitudes towards the animals may therefore affect the seriousness of attention and care exhibited by the farmers. Understanding the conditions for backyard pig production requires understanding both the physical and social factors involved.

In the following sections some aspects of pig production in Thailand, such as production parameters, environmental factors, social issues, and economic returns, will be discussed.

1.1 Significance of the study

In Thailand, pigs are the major small animal on small farms. Small scale pig producers make up about 97 percent of all producers, and the remaining 3 percent are medium to large scale commercial pig producers (Table 1). For the small farms, pigs are commonly reared as farm savings or stock for household assets and to utilize crop residues and family left-overs that otherwise have limited value.

Table 1. Percentage of holdings reporting swine, by specified size of herd.

Region	No of swine '000 head	Total holdings '000 head	Size of herd					
			1-4	5-19	21-49	50-99	100-499	>500
Thailand	100 (5,314)	100 (1,263)	79.35	17.83	2.29	0.35	0.17	0.01
Central	35.43 (1883)	100 (206)	60.71	29.85	7.03	1.51	0.83	0.07
NE	24.29 (1291)	100 (428)	84.86	13.72	1.28	0.11	0.04	0.00
South	13.51 (716)	100 (210)	80.92	17.65	1.33	0.08	0.02	0.00
North	26.76 (1422)	100 (419)	82.12	16.19	1.49	0.16	0.04	0.00

Note: Figures in parentheses are actual numbers.

Source: National Statistical Office, 1978 Agricultural Census Report.

Furthermore, pigs are important since they are a major protein source for Thais, constituting 40 percent of the total meat consumption. Pork consumption demand rises at an estimated rate of about 5 percent per year (Poapongsakorn, 1982). The study by Office of Agricultural Economics in 1973 revealed that pork has higher income elasticity of demand compared to other meats, i.e. individuals tend to increase the expenditure in pork consumption more than in other meats (Office of Agricultural Economics, 1973).

Although there is no official classification of pig production in Thailand, several types can be differentiated,

according to the orientation of the production as for either subsistence or commercial purpose. The orientation has an influence over the type of technology used by farmers, which relates to resource utilization, and production and economic efficiency as well. These classification types can be considered as:

1. Traditional pig-raising production (subsistence small farm; mixed crop-livestock)

Pig production in this system is often associated with rice production. The main purpose of their pig production is for money savings and labor used is family labor. Management and disease control are rarely practiced. Farmers feed their pigs with low cost indigenous feed or low-nutrition feed such as rice bran, crop stems, aquatic plants, etc., mixed with household waste. This system requires minimum cash inputs but much labor for feed gathering. The product quality is considered poor.

2. Semi-commercial pig production (small to medium farms; mixed crop livestock)

This category is found in farmers who practise mixed crop-animal systems with greater animal components compared to farmers in traditional systems. These

producers raise pigs for supportive income. The pigs get better feed, management and disease control than in the traditional system. This system does not require much cash because farmers can use inputs at very low cost. The use of family labor is typical.

3. Medium-to-large commercial production

These producers raise pigs as a main income source. They are the most economically efficient in their piglet production and in making their own mixed feed. These farms use intensive fattening methods with high quality swine catering to more selective markets in the cities. With modern technology and hired labor, pigs are fed with high density, highly digestible rations and raised with sanitation control.

Commercial farms are found near city areas. However, traditional and semi-commercial pig farms exist in almost every area. Since the pigs are raised behind farmers' houses in a relatively small area, the term "backyard" will be used to describe both these types of production. In this study, all pig farmers belonged to the "backyard" type, and differed in terms of level of management and feed quality. The following chapters analyze their attitudes, production

practices, and economics. Since the investment, management and nutrition conditions in the backyard production are very different from those on commercial farms, comparison is difficult and will not be attempted in this study.

Backyard pig-raising in the past required zero or limited investment on the farms. Farmers would let their pigs feed themselves during their life cycle, either through grazing, scavenging, or utilizing garbage. The size of pig herds was determined by the capacity of the system to feed the animals. Backyard pig-raising was regarded as a well functioning component in small farm households (Figure 1).

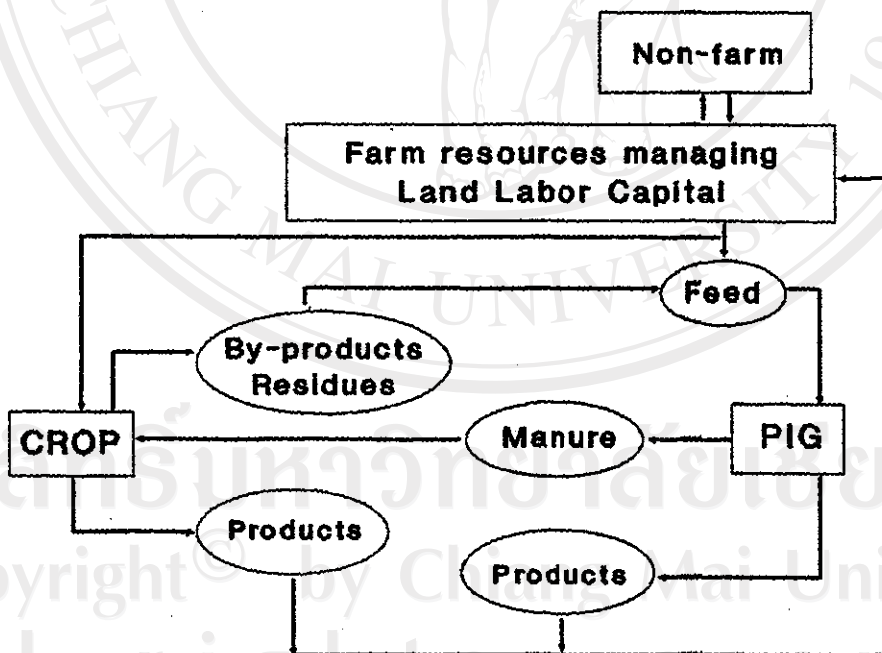


Figure 1. Relationship between pigs and other components in a small farming system.

The structure of backyard pig production in Thailand has undergone little change over the years. In the 1970's there was remarkable growth of swine production, due to a growing demand for meat and the development of the animal feed industry, which geared pig production of Thailand into large commercial farms. Rice bran, formerly of no commercial value, but used by backyard pig producers as pig feed, was also a necessary ingredient in the commercial mixes prepared by the feed industry. Consequently, rice millers collected the bran for sale to the industries; if farmers wanted to keep their bran after the milling process, they would have to pay a service charge. The new cost of rice bran and the continual expansion of commercial and semi-commercial farms inevitably affects the economic efficiency of the backyard pig raising system. In addition, the advantage of commercial farms over small farms such as advanced technology, efficient management and larger capital investments, gives the large-scale farmer a competitive edge over the small-scale farmer in the marketplace.

Two of the major factors influencing pig productivity are feed and improved breeds, in which feed has been considered to be the most dominant. In order to compete with commercial production, backyard farmers have to change their methods of pig-rearing with respect to: (a) type of

feed and feed supplement and (b) raising period. An exploratory survey by the author found that farmers do not utilize their farm products as much as in the past. Since farmers own less land, and plant even smaller areas to rice, the availability of rice by-products from their own farms has decreased. The balance between the size of pig herd, and of available pig feeds is being disrupted and farmers have to change into cash investment. Whether recovering rice bran from the miller or buying commercial mixes, farmers have to use more cash. They use concentrated feedstuffs or complete formula feed in greater quantities and frequencies than before, thus increasing their production costs. In fact, the truly "traditional" farmers using only home-supplied feeds are now rare.

Some economic studies have indicated that backyard production is characterized by low productivity and waste (Uraikul, 1982), especially in comparison to commercial scales of production (Office of Agricultural Economics 1978). A study of pig production of the northeast farmers in 1979 found that the unit cost of fattening a pig, excluding family and hired labor costs, was 1,030 baht, whereas the average price for a pig sold was 1,258 baht (Khon Khaen University, 1980). Therefore, only a small amount of profit can be made by these small farms.

Unfortunately, few studies have systematically compared the costs of pig fattening for various scales of production. In particular, it is very difficult to obtain accurate measurements of the costs of backyard production. Presently there are disputes as to whether or not the backyard pig raising system should be encouraged. The Livestock Department under the Ministry of Agriculture and Agricultural Cooperatives has been considering ways of eliminating backyard pig production since it is believed to be an un-economical operation. However, recent interviews with Chiang Mai Livestock officials reveal that the number of these small producers is not likely to decrease.

1.2 Rationale of the study

Despite difficulties existing in backyard pig production, small producers continue to raise pigs and are apparently satisfied with the results. A relevant question is why do farmers continue their pig-raising practices?

The apparent contradiction between poor economic performance and the prevalence of pigs on small farms appears to be due to inappropriate and insufficient economic analysis and lack of social understanding of the factors

influencing the performance of pigs under the mixed farm conditions. It is not quite clear how pigs contribute to the small farm economy, particularly in northern Thailand. Do they perform more of a social function rather than an economic one? Do they fulfill a strategy of risk avoidance by diversifying investment into mixed crop-animal systems? Can social perception of need for stability and insurance actually outweigh low productivity, when the latter is quantified in purely economic terms? These are important issues, and will be investigated in this study. The results can contribute to the design of future research and extension programs in backyard pig production.

1.3 Review of related literature

An abundance of economic analyses of pig production exists. Studies conducted in Thailand and the Philippines have reported that the productivity of small scale or backyard pig raising is markedly lower than that of commercial scale production (Office of Agricultural Economics, 1973; Buetre, 1984 respectively). Production function analyses indicate that feed has the highest influence on physical production gains (Buetre, 1984; Dickey et al., 1987), but these analyses have not separated the

relative efficiencies of different feed components. Viratphong (1983) conducted an agricultural economic feasibility study of pig-raising groups in northeast Thailand, and found that group productivity was higher than that of individual farmers, mainly because the groups could buy inputs at wholesale price, while sharing transportation costs and processing their own feedstuffs together. His study demonstrated a better benefit to cost ratio and greater feed efficiency in group production. The return to investment was greater than one for starch and drugs, but less than one for feed concentrate and bran. The study still lacked a comparison of efficiencies between the different feed components. Poapongsakorn (1985) compared the costs and profits of semi-commercial and intensive pig production, but did not include backyard production. Brannon et al. (1983) made an economic analysis of feed conversion ratios on small farms in Thailand, and quite interestingly, found that farmers were losing money by using improved rations. On the other hand, he noted, local feeds can experience shortages during the year and should therefore be supplemented with some stable but locally processed food items.

These studies have been very useful in evaluating the economic productivity of various pig-raising systems,

although a production analysis of very small traditional backyard systems has not yet been attempted. A clear understanding of pig-raising activities, however, also requires the integration of socially-oriented studies. De Vaccaro (1988) has suggested that most technological approaches to increase pig production fail to recognize farmers' objectives, which are often not so commercially-oriented as a researcher supposes. Tan (1987) argues that Malaysian Agricultural On-farm research tends to overemphasize newly developed technologies, rather than identify farmer needs first. A move towards research for mixed crop-animal farms is proposed. Camoens (1987) stresses the need for livestock production research to incorporate the human component in terms of culture, tradition, social influences, individual and group aspirations.

Studies which have sought farmers' motives for raising pigs most frequently present the concept of savings, easily converted cash income, security, and convenient use of crop by-products (Brannon et al., 1983; Crotty, 1980; Devendra, 1988; Dickey et al., 1987; FSRP, 1984; Harwood, 1979; Poapongsakorn, 1985; De Vaccaro, 1988). Constraints to backyard pig raising, on the other hand, have been suggested by several writers. High cost of feed in Sri

Lanka (Ravindran et al., 1984), Pakistan (Akhtar & Amir, 1987), and Philippines (Buetre, 1984), as well as poor availability of locally-produced high quality foods (Poapongsakorn, 1985; Devendra, 1988) and poor breed quality (Akhtar & Amir, 1987; Luangyosluechakul, 1990) has been cited. Tran (1988) and Chantalakan (1983) argued that a wide variety of local plant species in Vietnam and Thailand respectively could provide much feed, although lacking in protein, but made no mention of what farmers actually do use and prefer. Poor feed conversion in traditional farms has been blamed (Brannon et al., 1983; Nestel, 1975; Poapongsakorn, 1985; Quijandra, 1981). Nestel refines the constraints into two sets: factors limiting animal production, and those limiting feed production, such as soil fertility, climate and human cultivation or gathering practices. In a detailed study of pig production in northeast Thailand, Luangyosluechasakul (1990) identified four constraints: breed, feed, management, and sanitation and disease control. Regarding feed, he explained that insufficient quantity was often provided to pigs, based on farmers' incorrect assumption of feeding capacity, and poor quality foods were due to lack of protein, minerals and vitamins. Quality of rice bran itself could be affected by farmers' cultivation practices: inadequate fertilization could result in rice grain and especially bran low in

minerals and vitamins. The study emphasized mainly social reasons for the constraints, which suggests that appropriate social changes might improve the situation. Ravindran et al. (1984) also considered poor management, poor marketing facilities, lack of credit and disease to be constraints. They proposed major research towards identifying and evaluating cheap feedstuffs, and promoting crop-livestock-fish and poultry systems. These seem to be logical suggestions, but would be even more relevant had they included a study of farmers' objectives and priorities as their basis.

Risk avoidance is commonly cited as a strategy taken by small scale farmers to overcome unexpected hazards and losses. According to Gartner (1984), this approach can have several components including diversification, e.g. of crops or especially crop-livestock mixed farming system, flexibility in choosing a set of products based upon changing market sale prices, costs of inputs or time required, and production management and modification of goals. In a study in Suphan Buri, Pholdee (1989) found that many irrigated rice farmers responded to farm diversification, flexibility and liquidity, as well as production management and goal modification when reducing risk. The study noted that too much diversification could, on the other hand, result in

neither crop being well-managed.

This theory of risk avoidance can be especially applied to mixed crop-animal systems, particularly backyard pig-raising. Harwood (1979) pointed out that animals in general stabilize farm productivity during climate fluctuations which affect crops, and also stabilize household budgets when sudden needs for cash or slaughtered animals for special events arise. Similar motives might apply to small scale farmers in northern Thailand.

1.4 Objectives

In light of the above situations, the main objectives of this study are:

1. To identify economic and social components and their interactions in backyard pig production.
2. To analyze resource allocation in backyard pig production in relation to crop activities.
3. To identify farmers' objectives and social factors which influence the continuation of backyard pig

production.

4. To identify technical component and measure the growth performance and economic efficiency of backyard pig production systems.

1.5 Research methods

1.5.1 Selection of the study area

Mae Taeng district was chosen to be the study area, as it is believed to be representative of Chiang Mai province and includes both advanced agriculture as well as traditional practices in some crops. In 1973, Mae Taeng was selected to join the "Northern Regional Development Program", a cooperative program between the Thai and Japanese governments. At that time, Mae Rim, Hang Dong, San Patong, and San Sai districts were considered more advanced in cropping intensity and agricultural technology.

The sampling site was selected by purposive sampling: four subdistricts were chosen from 12 subdistricts of Mae Taeng. The four subdistricts were chosen according to similarity in topography, cropping patterns, land-holding

size, and irrigation services. Inthakil, Chorlae, Ban Pao, and Mae Hor Pra subdistricts were selected.

Random sampling techniques were then used to select 140 households, for which the criteria was based upon the prevalence of small-scale pig production at 80 percent, and medium-scale pig production at 20 percent. Later a sub-sample of 33 households was designated for an intensive study on Household Record-Keeping methods, and for the Attitude Test, on the basis of willingness to participate. Table 2 presents the selection of households by village.

Table 2. Selection of sample households for study.

Sub-district /village	No. households for Formal Survey							No. households for Daily Record- Keeping (HHRK) and Attitude Test		
	Divided by farm size				Divided by # pigs/hh			Divided by # pigs/hh		
	S	M	L	Ttl	1-4	>5	Ttl	1-4	>5	Ttl
Inthakil										
Den	5	6	1	12	14	4	18	2	1	3
Pong	6	6	1	13	18	4	22	2	1	3
Maung Kam	8	8	2	18	12	5	17	3	1	4
Ban Pao										
Pao	8	8	1	17	13	3	16	3	1	4
Sob Lerm	8	7	1	16	14	3	17	4	1	5
Chorlae										
Chorlae	9	10	1	20	13	3	16	4	1	5
Sanpasak	8	8	1	17	11	3	14	2	1	3
Mae Hor Pra										
Mae Hor Pra	6	8	1	15	7	4	11	2	1	3
Kang Hong	5	6	1	12	7	2	9	3	0	3
Total	63	67	10	140	109	31	140	25	8	33

1.5.2 Data collection

Data were collected by the following methods:

1. Secondary information

Gathering of secondary data establishes the importance of pigs in the farming system, and provides general information on pig production.

2. Informal survey

By this method an investigation on production practices, inputs and outputs, and interactions between crops, pigs, and households was achieved.

3. Formal survey

The main purpose of acquiring information on existing backyard pig-raising systems necessitated building agro-economic profiles to describe farmers' constraints and opportunities. The survey included the following components:

- (a) Cropping systems profile;
- (b) Pig production data, including pig herd size, piglet species, age, size and feed used;
- (c) Labor profile and seasonal variations for all farm activities; and

(d) Household income and labor allocation to various farm activities.

4. Household Record Keeping (HHRK)

HHRK was used as a means of farm monitoring regarding specific constraints and strategies in pig management, resource uses, labor requirements, gender roles, marketing, and production costs and returns.

5. Attitude Measurement

Farmers were presented with a number of attitude statements of varying intensity, and asked for the statement which came closest to reflecting his or her own attitude. In this study attitude is understood to be the accumulation of what makes a farmer behave, think, and feel in a certain way.

1.5.3 Data analysis

The analysis sequence was divided into these stages:

a. Descriptive analysis

Data from informal and formal surveys were used to describe the general picture of backyard pig production.

b. Quantitative analysis

(i) Production (technical) analysis

The production analysis of backyard systems relied on HHRK data regarding pig cycle profile, piglet characteristics, average daily feed offered, average daily weight gain, feed conversion ratios, and feed cost per unit of live-weightgain

(ii) Economic analysis

Benefit-cost analysis with returns to capital and gross margin analyses were employed in measuring the economic efficiency of both backyard and semi-commercial production systems, with data from HHRK.

(iii) Social analysis

Farmers' objectives and attitudes were studied using attitude scaling and descriptive analysis.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

Copyright© by Chiang Mai University

All rights reserved