

Development of a System for Recording the Cost of Raising Fattening Pigs at Boonmee Farm 30 Company Limited

Adul Phuk-in^{1*}, Janjeera Promthong², Amornwan Inchuen²,

Singkom Wuttichart², Budsara Kongsak² and Pakamas Phuk-in²

¹Industrial Technology Program, Faculty of Industrial Technology, Uttaradit Rajabhat University. 53000, Uttaradit, Thailand.

²Bachelor of Technology, Program in Accounting, Uttaradit Vocational College. 53000, Uttaradit, Thailand.

*Corresponding author. E-mail : Adul.Phu@uru.ac.th

ABSTRACT

The objective of the research subject on Development of a system for recording the cost of fattening pigs in fattening farms, Boonmee Farm 30 Co., Ltd. is to study the general condition and data of cost raising fattening pigs, and develop a system for recording the cost of raising fattening pigs of the fattening farm, Boonmee Farm 30 Co., Ltd. From the study of the company's problems, there is no systematic data on the cost of raising fattening pigs. The finding of cost raising pigs takes a long time and unable to specify of cost raising. The research group therefore developed a system to record the cost of raising fattening pigs in fattening farms, by using the program to record the cost of raising fattening pigs for 3 houses. These are the F14 pig house, F15 pig house and F16 pig house. They collected the information on the cost of transfer from the breeder farm, the cost of food, medicine and medical supplies, farming cost and the distribution costs. The cost of raising pig at F14 pig house is 4,071,376.11 baht, with 573 pigs, with a cost of raising 7,105.37 baht per head. The cost of raising pig at F15 pig house is 4,275,661.42 baht, with 578 pigs, with a cost of raising 7,397.34 baht per head and the F16 pig house is 4,343,487.21 baht, with 589 pigs, with a cost of raising 7,374.34 baht per head. For the sale of pigs in the 3 houses, it was found that the F16 pig house had the highest sales amount of 5,144,587.50 baht, followed by the F15 pig house with the sales volume of 4,876,798.00 baht, and the F14 pig house had the sales amount of 4,855,943.00 baht. After deducting the cost of raising pigs, it was found that the F14 pig house was the most profitable at 16.16 percent, the F16 pig house was the most profitable at 15.57% , and the F15 pig house was the hundredth most profitable at 12.33%. This research therefore meets the research objectives, and "the system to record the cost of raising fattening pigs" can be used to manage costs of Boonmee Farm 30 Company Limited.

Keywords: *development of cost record system, fattening pig farming, Pig House F14, F15, and F16*

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INTRODUCTION

Boonmee Farm 30 Company Limited is a legal entity, established on January 8th, 2016 with authorized capital of 5,000,000.00 baht. Mr.Pichet Sawangrote is the Managing Director. Animal husbandry business, livestock, meat, animal breeding selling pork both retail and wholesale and frozen pork has been certified by Good Manufacturing Practice: GMP is a quality assurance system that has been implemented in food production. (Kim, 2021) There are two farms for raising pigs, sow farm and fattening pig farms. (Iyai, 2021) The sow farm will raise nursery pigs and care for nursery pigs about 50-65 days, after that the nursery pigs are transferred from the sow farm to the fattening pig farm. A fattening pig farm has 20 houses, 1 house for 560 pigs but not more than 600 pigs. The fattening pig farm is responsible for raising nursery pigs to be fattening pigs, weight not less than 80 kg or age over 180 days. Boonmee Farm 30 Co., Ltd. has a total of 11,200 pigs that are sold and exported every day, at least 60-100 pigs per day. The recording of the cost of raising pigs in each house, each version does not have a clear classification of the items that occur. This causes the control, monitoring and evaluation to still have flaws in the current cost of fattening pigs. The research group therefore developed a system to record the cost of raising fattening pigs. The research group therefore developed a system to record the cost of raising fattening pigs, (Iyai et al, 2021) to bring the data for cost analysis raising pigs of fattening farms, Boonmee Farm 30 Co., Ltd. It will be a system that collects from the funds received from the sow breeding farm until raising the pigs to the age according to the specified distribution criteria. There are various expenses incurred, such as pig breeding costs, food costs, medicines and medical supplies and the cost of raising fattening pigs. The system records the cost of raising pigs, and the manager can use information to plan for management of the business properly and correctly.

THEORIES AND RELATED RESEARCHES

The research group studied the theory and related research by study of data from various sources is presented as follows:

1. Cost of production refers to the measure of the value of resources used. (He et al, 2020) It is measured in terms of monetary units. This definition of cost consists of three concepts: measure the amount of resources used, measured in terms of monetary units and the cost measure must always be related to the objective. (Iversen et al, 2020, Sukraseranee et al. 2020) The cost can be classified into 3 items as follows: (Oostlander et al, 2020; Martnez et al, 2020; Keeratiphaj, 2020; Wang et al, 2020)

1) Direct raw materials refer to the raw materials that are the main components of the manufactured goods and can easily calculate the raw materials used to produce 1 unit of finished goods. (Iversen et al, 2020; Oostlander et al, 2020)

2) Straight wages means wages at the normal rate paid to employees' that act directly on the production of goods, and it can be easily calculated per 1 production unit. (Oostlander et al, 2020)

3) Production costs mean all expenses related to the production of goods other than direct raw material and direct labor costs, production cost. It is the direct cost related to the production of the product. (Iversen et al, 2020; Oostlander et al, 2020; Iyai, 2021)

2. Related research, the research group reviewed the literature, showing as following:

Oostlander, P. C. et al, (2020) Microalgae are a crucial part in many aquaculture feed applications processes, mainly in hatcheries. Many aquaculture hatcheries maintain a small scale microalgae production facility in-house for the production of live feed. Microalgae are usually grown in non-automated bubble-column systems at unknown production costs. Other reactor systems or scenarios utilizing artificial light or sunlight and at different scales could result in a more cost efficient production processes. To determine the cost-price and cost-distribution of microalgae production facilities in Dutch aquaculture industry and identify the most efficient cost reducing strategies a techno-economic analysis for small scale microalgae production facilities (25-1500 m²) was developed.

Iversen, A. et al, (2020) This research investigates the development of production costs in aquaculture of Atlantic salmon between the five main producer countries. A unique data set allows us to analyse the development in the period 2003 to 2018. Costs have developed differently between countries, with Chile and the Faroe Islands standing out with strong and different changes. Chile sees a strong increase in cost and moves from being the lowest to the highest cost producer, and then to lowest again.

Somkhampha, S., (2019) Conducted research regarding the returns from raising pigs at Ban Na Nok, Wang Khuang Sub-district, Phran Krai District Kamphaeng Phet province. It was found that the farmers had a statement of financial status, consisted of average total assets of 1,947,457.14 baht, average pig care equipment 28,285.71 baht, average land value 45,714.29 baht, profit and loss statement consists of income 110,428 baht, net profit of 97,357.14 baht.

Ivan, M., (2017) The study deals with the analysis of production costs, as well as the net area in the production of the herd of organizational structures at the pig farm. The question arises of the optimum production structure in the cooperative household, which is mainly oriented to the production of Pigmeat.

MATERIALS AND METHODS

The research group conducted a study on the cost of raising fattening pigs, Boonmee Farm 30 Co., Ltd. from the population, research and planning, problem analysis and solution as follows.

The research uses the research population to be divided into 5 groups of the population as follows: 1 management, 1 farm manager, 1 farm animal husbandry, 1 farm administrator, and 10 pig workers, by designing an interview form that is divided into 5 parts according to the population and do the quality check by 3 experts. The interview form is an open-ended structure, emphasizing in-depth interviews with cost informants in each section and cost answers that have been analyzed for planning the use of calculation formulas and designing a program for recording system. The study tries for three pig houses: F14, F15, and F16 due to limitations in the duration of raising pigs (shown as picture 1). Collecting and bringing data on pig farming costs from June 2020 to December 2020 for a total period of 7 months. To record the cost of raising pigs in the cost recording system package and take the data to calculate costs and returns.




|  บริษัท บุญมีฟาร์ม 30 จำกัด BOONMEE FARM 30 COMPANY LIMITED 82 หมู่ 5 ตำบลวังใหม่ อําเภอมะนัง จังหวัดอุตรดิตถ์ ๓๓๑๕๕-๔๘๘-๔๒๘ Moo 5, Ngam Subdistrict, Maeang District, Uttaradit Province 53000 | | Research on the development of a system to record the cost of raising pigs in fattening farms, Boonmee Farm 30 Co., Ltd. ch on the development of a system to record the cost of raising pigs in fattening farms, Boonmee Farm 30 Co., Ltd. | | | | | |
|---|-----------------|--|-------------------|--------------|--------------------------|--------------------------|-----------------|
| F15 Pig house | | | | | | | |
| Nursery pig summary | | | | All expenses | | Average expenses per pig | |
| Start date | Amount (number) | น้ำหนักรวม (ก.ก.) | Total weight (kg) | Age (days) | Note | | |
| 13-07-63 | 124 | 2,938.00 | 23.69 | 64 | Pig feed cost | 1,983.440 331,978.92 | |
| 14-07-63 | 240 | 5,575.00 | 23.23 | 65 | Medication (vaccination) | 69,610.00 120.43 | |
| 15-07-63 | 214 | 4,651.50 | 21.74 | 66 | Medical supplies | 3,645.00 6.31 | |
| รวม | 578 | 13,164.50 | 13,742.50 | | Medicine mix food cost | 480.00 0.83 | |
| Total | | | | | | 2,389,153.92 | 4,133.48 |

Figure 1 the farm and the cost recording system for fattening pigs of Boonmee Farm 30 Company Limited.

2. Statistical data analysis methods: Use the formula to find the cost and return of Boonmee Farm 30 Co., Ltd. The research used 5 formulas are finding the cost of raising pigs (Manufacturing Costs), (Iversen et al, 2020; Oostlander et al, 2020) calculating gross profit, calculating the percentage of gross profit, calculating the cost of pig production per head and the calculating of gross profit per head is shown as follows:

Substitute variable

F = Pig house of fattening farm, Boonmee Farm 30 Co., Ltd.

i = Order of pig houses = 1, 2, 3,..n

TC_{Fi} = cost of raising pigs at Fi

FG = cost of transferring from the breeder farm

DM_{Fi} = direct raw material at Fi

VL = employee salary at Fi

DL_{Fi} = direct labor costs at Fi

MM = factory materials used at Fi

OH_{Fi} = The cost of raising pigs at Fi

MU = utility bills at Fi

GPP_{Fi} = Percentage of gross profit at Fi

ML = shipping cost at Fi

ATC_{Fi} = Pig cost per head at Fi

FF = food cost at Fi

GPU_{Fi} = gross profit per head at Fi

Q_{Fi} = number of pigs in the house

GP_{Fi} = gross profit at Fi

TR_{Fi} = pig sales at Fi

DE = Building depreciation

FM = medicine and medical supplies at Fi

The research was based on data from the cost recording system of fattening pigs at Boonmee Farm 30 Company Limited of the pig houses at F15 to substitute the formula 1.1, the formula 1.2, the formula 1.3, the formula 1.4 and the formula 1.5 shown as follows:

2.1 Finding the cost of raising pigs (Manufacturing Costs), (Iversen et al, 2020) from the formula 1.1 substitute the F15 pig house, the cost raising of F15 pig house is divided into direct materials obtained from data collection.(Oostlander et al, 2020; Ivan, 2017; Sukraseranee et al, 2020)

$$TC_{Fi} = DM_{Fi} + DL_{Fi} + OH_{Fi} \quad (1.1)$$

Food, medicine and medical expenses, the cost of transferring from the breeder farm, direct labor cost data collection, animal husbandman salary and the staff salary of F15 pig house are shown as follows:

Cost of raising pigs F15 = F15 raw materials + F15 direct labor costs + F15 pig farming costs

$$= 4,210,003.06 + 48,680 + 16,978.36$$

Therefore, the cost of raising pigs at F15 pig house is 4,275,661.42 baht.

2.2 Calculation of gross profit from formula 1.2 of F15 pig house, the sales of pigs of F15 pig house is equal to 4,876,798 baht.

$$GP_{Fi} = TR_{Fi} - TC_{Fi} \tag{1.2}$$

The cost of raising pigs from formula 1.1 is 4,275,661.42 baht. The calculation for the gross profit of F15 pig house is shown as follows.

Gross profit at F15 = total number of pig sold of the F15 pig house – pigs raising costs from formula 1.1

$$= 4,876,798 - 4,275,661.42$$

$$= 601,136.58 \text{ baht}$$

2.3 Calculating the percentage of gross profit from formula 1.3, substitute the cost of the F15 pig house, get the percentage of gross profit by taking the sales of pigs at F15 pig house is 4,876,798 baht to subtracting the cost of raising pigs of F15 pig house from formula 1.1 is 4,275,661.42 baht, percentage is shown as follows:

$$GPP_{Fi} = \frac{TR_{Fi} - TC_{Fi}}{TR_{Fi}} \times 100 \tag{1.3}$$

$$\text{Percentage of gross profit F15} = GPP_{15} = \frac{4,876,798 - 4,275,661.42}{4,876,798} \times 100$$

Therefore, the percentage of gross profit at F15 pig house is 12.33%.

2.4 Calculation of the cost of pig production per head (Cost of Pigs Manufactured)

$$ATC_{Fi} = \frac{TC_{Fi}}{Q_{Fi}} \tag{1.4}$$

From formula 1.4, substitute the F15 pig house cost, the cost of rearing pigs per head, by taking the cost of raising pigs of F15 pig house from formula 1.1 equals 4,275,661.42 baht, dividing the number of pigs in the F15 pig house equal to 578 heads, the cost of raising pigs per head at F15 pig house is shown as follows:

$$\text{Pig cost per head at F15 pig house: } ATC_{F15} = \frac{4,275,661.42}{578}$$

Therefore, the cost of rearing pigs per head at F15 pig house is 7,397.34 baht.

2.5 Calculating gross profit per head, from formula 1.5, substitute the F15 pig house cost; get gross profit per head of the F15 pig house by taking the gross profit of the F15 pig house from the formula 1.2 equals 601,136.58 baht.

$$\text{GPU}_{\text{Fi}} = \frac{\text{GP}_{\text{Fi}}}{\text{Q}_{\text{Fi}}} \quad (1.5)$$

and dividing by the number of pigs in the F15 pig house is equal to 578 pigs, the gross profit per head of the F15 pig house is shown as follows:

$$\text{Gross profit per head of F15 pig houses} : \text{GPU}_{\text{F15}} = \frac{601,136.58}{578}$$

Therefore, gross profit per head of the F15 pig house is 1,040.03 baht.

From the formula (formula 1.1), Finding the cost of raising pigs (Manufacturing Costs) of the F15 pig house is 4,275,661.42 baht. Calculation of gross profit (formula 1.2) equals 601,136.58 baht. Percent Calculation Gross Profit (formula 1.3) equals 12.33%. Cost of Pigs Manufactured per head (formula 1.4) is 7,397.34 baht and gross profit per head (formula 1.5) is 1,040.03 baht.

RESULTS

1. Conducting a study on general conditions and cost data of raising fattening pigs, Boonmee Farm 30 Co., Ltd., it was found that the business operation had 2 farms for raising pigs, comprising sow breeding farms and fattening pig farms (shown as figure 2). The sow farm will breed nursery pigs. And take care of the nursery pigs to reach the age of 50-65 days, and then transfer the nursery pigs from the sow breeding farm to the fattening pig farm. A fattening pig farm has 20 houses, one of which can house 560 pigs up to 600 pigs. The fattening pig farm is responsible for raising the nursery pigs to at least 80 kg in weight or aged 180 days or more. Boonmee Farm 30 Co., Ltd. has a capacity of raising 11,200 pigs. They are sold and sold out every day, at least 60-100 pigs per day. However, the current cost recording of fattening farms of Boonmee Farm 30 Company Limited does not collect information about the cost of raising pigs in each house and the reared version. (Iyai, 2021; Hansen, 2018) The pre-research system makes to find the total cost data difficult and there is no clear classification of the cost incurred, which make control follow-up and evaluation are still flawed. The problem data was collected and analyzed through the research process; therefore, a system for recording the cost of raising fattening pigs was designed and developed for Boonmee Farm 30 Company Limited. Then, the program design to have a storage period for raising costs such as the cost of transferring piglets from breeder farms, the cost of feed for fattening pigs, the cost of medicines and medical supplies, the factory salary list of pig house staff and expenses incurred during the fattening pigs, etc. The development of a system for recording the cost of fattening pigs of the fattening farm, Boonmee Farm 30 Co., Ltd., developed a daily cost data collection,

data storage of raw material raising costs, labor costs, and the cost of raising pigs, it makes the system efficient in storing business costs, as shown in the example costs 1.1 and 1.2.



Figure 2 the condition of the pig farm of Boonmee Farm 30 Co., Ltd.

1.1 Showing the cost of feed for fattening pigs of fattening pig farms, Boonmee Farm 30 Co., Ltd. of F14 pig house, F15 pig house and F16 pig house are shown in Figure3.

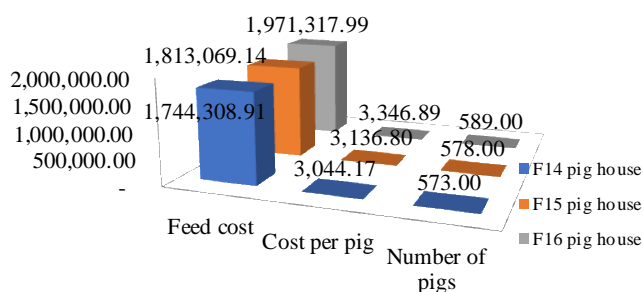


Figure 3 the cost of fattening pig feed for F14 house, F15 house and F16 house

From figure 3: shows the cost of fattening pig feed for 3 houses F14, F15 and F16. The comparison of the cost of fattening pig feed, it was found that the pig house at F14 had the lowest cost in feeding an average of 3,044.17 baht each, the pig house at F15 has an average cost of 3,136.80 baht per pig, and the pig house at F16 has the highest cost at 3,346.89 baht per pig.

1.2 Cost of medicines and medical supplies in raising pigs of fattening farms, Boonmee Farm 30 Co., Ltd. is shown in Figure 4.

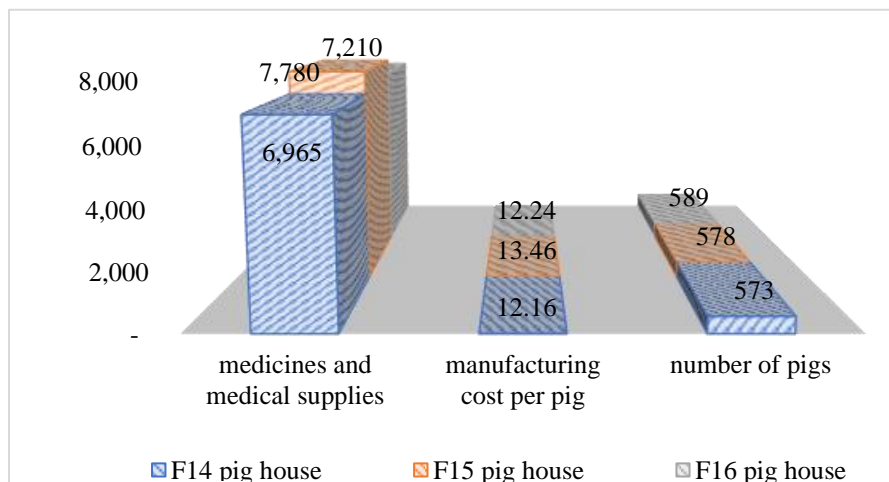


Figure 4 the cost of medicines and medical supplies.

Figure 4 shows the cost of medicines and medical supplies for 3 houses. As the cost comparison results, it was found that the F14 pig house had the lowest cost of medicines and medical supplies at 6,965 baht, an average of 12.16 baht per pig, the F16 pig house had the cost of medicines and medical supplies at 7,210 baht, averaged 12.24 baht per pig, and the F15 pig house had the highest cost of drugs and medical supplies at 7,780 baht, averaging 13.46 baht per pig.

2. The research data was collected on the cost of raising pigs through the fattening pig cost recording system of Boonmee Farm 30 Co., Ltd, from June 2020 to December 2020 for a period of 7 months. The cost of raising pigs was recorded in the program; there were 3 houses which were F14 pig house, F15 pig house and F16 pig house. Each house costs incurred are summarized; the cost comparison is shown in Table 1.

Table 1 shows a manufacturing-cost comparison of the three pig houses.

| List | Pig house at F14 (baht) | Pig house at F15 (baht) | Pig house at F16 (baht) |
|------------------------------------|----------------------------|----------------------------|----------------------------|
| Sales | 4,855,943 | 4,876,798 | 5,144,587.50 |
| cost of raising pigs | 4,071,376.11 | 4,275,661.42 | 4,343,487.21 |
| gross profit | 784,566.89 | 601,136.58 | 801,100.29 |
| percentage of gross profit | 16.16 | 12.33 | 15.57 |
| Number of pigs (heads) | 573 | 578 | 589 |
| Cost of raising pigs (per head) | 7,105.37 | 7,397.34 | 7,374.34 |
| gross profit per pig | 1,369.23 | 1,040.03 | 1,360.10 |

Table 1 shows the comparison of the cost of raising pigs in 3 houses. It was found that the F16 pig house had the highest sales amount of 5,144,587.50 baht, followed by the F15 pig house with a sales volume of 4,876,798 baht, and the F14 pig house had a sales amount of 4,855,943 baht. The F16 pig house had the highest cost of raising pigs at 4,343,487.21 baht, followed by the F15 pig house, with the cost of raising pigs at 4,275,661.42 baht and the F14 pig house, the cost of raising pigs was 4,071,376.11 baht. When comparing the gross profit, it was found that the F16 pig house had the highest gross profit equal to 801,100.29 baht, followed by the F14 pig house, equal to 784,566.89 baht, and the F15 pig house, equal to 601,136.58 baht. Considering the percentage of gross profit, it was found that the F14 pig house had 16.16 percent of the gross profit, followed by the F15 pig house with 12.33 percent of gross profit and the F 16 pig house with 15.57 percent of the gross profit. The cost of raising pigs per head was the highest, which was the F15 pig house, which was 7,397.34 baht, followed by the F16 pig house, which was 7,374.34 baht and the F14 pig house is 7,105.37 baht, and found that when comparing the gross profit per head of the F14 pig house, the gross profit per head was 1,369.23 baht, followed by the F16 pig house, equal to 1,360.10 baht, and the F15 pig house was 1,040.03 baht.

CONCLUSIONS AND DISCUSSION

The research studied the general condition and cost data of raising fattening pigs, Boonmee Farm 30 Company Limited, which found the problem of the company does not have a systematic record of the cost of raising the fattening pigs, which makes finding the cost of raising pig takes a long time and unable to specify the cost of raising. Research has developed a system to record the cost of raising fattening pigs in fattening farms by developing a program to be able to store information on fattening pigs. Recording the cost of transferring piglets from breeding farms, the direct recording of raw material costs is the cost of food; cost of

medicines and medical supplies, the cost of labor is the salary of animal husbandman and labor cost for pig farmers, and the cost of raising pigs is the factory materials used, utility bills depreciation, transportation costs. Data collection using structured interview tools, the research population is the management group, farm manager group, animal husbandman group, farm admin group, and a group of staff who raise pigs a total of 14 people. The research recorded the cost of raising fattening pigs in three pig houses: F14, F15 and F16. The results showed that Boonmee Farm 30 Co., Ltd. had information on the cost of raising, from the cost of transfers from the breeder farm, the cost of food, medicine and medical supplies, the expenses during raising pigs until the sale of pigs.

The research found that the cost of raising pigs in the F14 pig house has 573 pigs, the cost of raising 4,071,376.11 baht, and the cost of raising the pigs per head is 7,105.37 baht, the F15 pig house has 578 pigs, the cost of raising 4,275,661.42 baht, the cost of raising the pigs per head is 7,397.34 baht, and the F16 pig house has 589 pigs, the cost of raising pigs is 4,343,487.21 baht, with the cost of raising pigs per head of 7,374.34 baht. The F14 pig house was profitable at 16.16 percent, followed by the F16 pig house with 15.57% and the F15 pig house with 12.33 percent. Therefore, this research is in accordance with the research objectives and can be used for manage the cost accounting system of Boonmee Farm 30 Co., Ltd.

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