COST-RETURN ANALYSIS OF STEAMED CHIVES PRODUCTION FOR INVESTMENT DECISION MAKING*

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Abstract

The objective of this research was to analyze cost, return, and profitability assessment for investment decisions making. Key informants were selected in purposive sampling amount thirteen persons. Data were gathered using the semi-structured interview. Financial Ratio, mean, percentage, and content analysis were used in data analysis.

Results indicated that the production cost of chives classified by the product composition consists of raw materials 56.95%, labor 37.91%, and overhead 5.14%. However, if classified by activities relationship consist of fixed costs 37.91% and variable costs 62.09%. The cost per unit is 2.03 baht, the estimated monthly net profit is 26,209.82 baht, the yearly is 341,156.85 baht, the gross profit margin is 59.40%, the net profit margin is 56.07%, and the return on investment is 163.55%.

Keywords: Cost; Return; Chives; Investment Decision Making

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บทคัดย่อ

บทความวิจัยนี้มีวัตถุประสงค์เพื่อวิเคราะห์ต้นทุน ผลตอบแทน และประเมินความสามารถในการทำกำไรเพื่อประกอบการตัดสินใจลงทุน ผู้ให้ข้อมูลหลักคัดเลือกด้วยวิธีเฉพาะเจาะจง จำนวน 13 คน เก็บรวบรวมข้อมูลด้วยแบบสัมภาษณ์กึ่งโครงสร้าง วิเคราะห์ข้อมูลโดยใช้อัตราส่วนทางการเงิน ค่าเฉลี่ย ค่าร้อยละ และการวิเคราะห์เนื้อหา

ผลการวิจัยพบว่า ต้นทุนการผลิตกุยช่ายจำแนกตามส่วนประกอบของผลิตภัณฑ์ประกอบด้วยวัตถุดิบ คิดเป็นร้อยละ 56.95 ค่าแรง คิดเป็นร้อยละ 37.91 และค่าใช้จ่ายการผลิตคิดเป็นร้อยละ 5.14 หากจำแนกตามความสัมพันธ์กับระดับของกิจกรรม ประกอบด้วยต้นทุนคงที่ คิดเป็นร้อยละ 37.91 และต้นทุนผันแปร คิดเป็นร้อยละ 62.09 ต้นทุนต่อหน่วยเท่ากับ 2.03 บาท กำไรสุทธิรายเดือนโดยประมาณเท่ากับ 26,209.82 บาท รายปีโดยประมาณเท่ากับ 341,156.85 บาท อัตรากำไรขั้นต้น ร้อยละ 59.40 อัตรากำไรสุทธิ ร้อยละ 56.07 และอัตราผลตอบแทนต่อเงินลงทุน ร้อยละ 163.55

คำสำคัญ: ต้นทุน; ผลตอบแทน; กุยช่าย; การตัดสินใจลงทุน

Introduction

Cost is the value of the resources that an organization uses to achieve its stated objectives. (Phadoongsitthi, 2016) The definition of accounting cost is the wasted resource in acquiring goods or services. Wasted resources include money, time, and labor (Rodwanna, 2013) Therefore, cost data is an important of information management uses in planning and making decisions. Effective decision making requires accurate cost estimation and will be calculate returns determination of the appropriate selling price is all based on cost basis analysis. Past research has found that the calculation of the return on production uses a number of costs as the basis for the calculation, for example: cost and return of cultivation macadamia with a net profit-to-cost ratio of 61.84% (Khampian, 2020) Cost-benefit analysis of crab aquaculture in marine and brackish water was found the return to cost ratio (B/C Ratio) was calculated equal to 1.07 (Promsuwan & Maewang, 2020) Costs and returns of native and recommended rice productions was found net profit margin from total costs 1.97% (Dungtripop & Lakkanawanit, 2018) Cost and return on investment for Japanese leek farming was found that the average fixed cost was 2,483 baht per time, the average variable cost was 19,250 baht per time, the average selling price per kilogram was 18.03 baht, and the gross profit was 7.48 baht per kilogram (Saklor et al., 2018)

The calculating cost of goods sold is easy because calculated by the purchase price including the shipping. But in the case of calculating the production cost will be more complicated because it has many production processes to get finished goods. Therefore, knowledge of costing is required such as the steamed chives production must calculate the cost of making chives flour, chives filling, sauces, including labor costs and overhead. Steamed chives has been popular continuously from the past to the present. It is a plant that originated in China some locals call it “Phak Pan”. The part used to make chives is leaves. It is green like a garlic leaf that is above the soil about 30-45 centimeters high. The Teochew Chinese called “Kuy Chay Kwy”. It uses rice flour mixed with flour, the filling is made from chives only. Chives in Thailand, there are many types of fillings, such as taro, bamboo shoots, Mexican yam, etc. There are three types of chives in Thailand, which are either round, tray, and Pak Mo (Chives, 2022). Six benefits of chives are 1. alleviating colds, 2. nourishing milk, suitable for mothers with babies and pregnant women, 3. reducing constipation, 4. reducing blood pressure, 5. reducing the incidence of vaginal discharge, and 6. Cure flatulence in children (Women, 2022) Nowadays, the consumption of chives is increasing. Originally sold in a flea market or street foods but currently sold in department stores with attractive packages to add value. There are many brands of business expansion and many forms as well as expanding the business in the form of a franchise.

Calculating costs and returns of chives is important for both the former business operators and those who are deciding to enter this business. When calculating the return received it must be further analyzed to profitability of business which is determined from the financial ratio known as profitability ratio is gross profit margin, operating profit margin, net profit margin, and the rate of return on investment in order to make investment decisions both in the short term and in the long term. Short-term decisions such as receiving special orders from customers, own production or resale. Long term decisions such as business expansion production line expansion. Therefore, having knowledge of costs, returns, and the ability to analyze financial ratios will help investors make the right investment decisions. Lastly, it is the origin of the study of cost and return analysis of steamed chives production in order to make investment decision.

Research Objectives

1. to analyze the initial cost and production cost of steamed chives
2. to analyze the return of steamed chives
3. To assess profitability and rate of return analysis for investment decisions in steamed chives production

Methodology

1. Key Informant

Key informants in the qualitative research were selected using a purpose sampling method for interviews by selecting the knowledgeable has experience in making chives for more than 10 years, selected from 3 recipes in different provinces as follows: recipe 1, Chaiyaphum Province consists of a chairman, three members; recipe 2, Bangkok Province consisting of a chairman, four members; and recipe 3, Nonthaburi Province Consists of a chairman, three members. A total of 13 key informants.

2. Research Instrument

The research instrument was a semi-structured interview. Data was collected using in-depth interviews with key informants inquiring about raw materials, equipment, recipes, production processes, storage and distribution are the criteria for questioning. After completing the interview the researcher summarizes each issue and recheck with the chairman.

3. Data Analysis

Financial Ratio, mean, percentage, and content analysis were used in data analysis by classify data systematically then interpret relationships and make conclusions. After analyze the data the researchers verify the reliability by confirm with chairman again in order to make the research results more accurate and complete.

Results

1. The initial cost and production cost calculation

1.1 Initial cost consist of dough kneading machine, chili blender, 3 layers steamer, gas tank 48 kg, gas tank joint kit, saucepan, table, threshing basket, wooden chopping board, big and small knife, bottle and cutting board, enameled

basin, scales, spatula, and other. The total amount is approximately 50,000 baht as shown in Table 1.

Table 1 The initial cost (unit: baht)

equipment	quantity	unit price	total	lifetime (year)	depreciation per year
dough kneading machine	1	18,000	30,000	5	3,600
chili blender	1	1,300	1,300	5	260
3 layers steamer	1	1,200	1,200	5	240
gas tank 48 kg	1	5,800	5,800	-	-
gas tank joint kit	1	600	600	5	120
saucepan	1	1,000	1,000	5	200
table	1	3,000	3,000	5	600
threshing basket	2	300	600	5	120
wooden chopping board	2	200	400	5	40
big knife	1	300	300	2	150
small knife	1	50	50	1	50
bottle and cutting board	1	450	450	5	90
enameled basin	4	160	640	5	64
scales	1	1,000	1,000	5	200
spatula	2	120	240	2	120
other			2,000		
total			**48,580**		**5,654**

1.2 Calculation of production costs classified by the product composition.

The 3 recipes of Chives, each recipe has a capacity of 390 pieces, the price of Chives is 50 baht per kilogram (Talaad Thai, 2022), details are as follows:

Chives recipes 1, the cost of raw materials consists of raw materials for making chives flour 86 baht, chives filling 418 baht, and sauces 18.63 baht. The total cost of raw materials is 522.63 baht (56.83%), the total labor cost is 300 baht (32.62%), the total overhead is 97 baht (10.55%), and total production costs 919.63 baht. After finished production, it can be sold 1,950 baht (390pieces x 5 baht) and make profit of 1,030.37 baht, according to Table 2.

Chives recipes 2, the cost of raw materials consists of raw materials for making chives flour 89.27 baht, chives filling 165.24 baht, and sauces 133.71 baht. The total cost of raw materials is 388.22 baht (55.60%), the total labor cost is 300 baht (42.97%), the total overhead is 10 baht (1.43%), and total production

costs 698.22 baht. After finished production, it can be sold 1,950 baht (390pieces x 5 baht) and make profit of 1,251.78 baht, according to Table 2.

Chives recipes 3, the cost of raw materials consists of raw materials for making chives flour 106.67 baht, chives filling 288.86 baht, and sauces 45.56 baht. The total cost of raw materials is 441.09 baht (58.34%), the total labor cost is 300 baht (39.68%), the total overhead is 15 baht (1.98%), and total production costs 756.09 baht. After finished production, it can be sold 1,950 baht (390pieces x 5 baht) and make profit of 1,193.91 baht, according to Table 2.

The average cost of chives in 3 recipes showed that the cost of raw materials consisted of ingredients for making chives flour 93.98 baht, chives filling 290.70 baht, and sauce 65.97 baht, so the total cost of raw materials is 450.65 baht (56.95%). The total labor cost is 300 baht (37.91%). The total overhead is 40.66 baht (5.14%), Overall the total production cost is 791.31 baht. After finished production, it can be sold 1,950 baht (390 pieces x 5 baht) and make profit of 1,158.69 baht, according to Table 2.

Table 2 The production cost classified by the product composition (unit: baht)

No.	item		recipe 1	recipe 2	recipe 3	average
1	raw materials					
	chives flour		86	89.27	106.67	93.98
	chives filling		418	165.24	288.86	290.70
	sauce		18.63	133.71	45.56	65.97
		total	522.63	388.22	441.09	450.65
			(56.83%)	(55.60%)	(58.34%)	(56.95%)
2	labor		300	300	300	300
			(32.62%)	(42.97%)	(39.68%)	(37.91%)
3	overhead		97	10	15	40.66
			(10.55%)	(1.43%)	(1.98%)	(5.14%)
the total production cost			919.63	698.22	756.09	791.31
			(100%)	(100%)	(100%)	(100%)
sales			1,950	1,950	1,950	1,950
profit			**1,030.37**	**1,251.78**	**1,193.91**	**1,158.69**

1.3 Calculating the production cost per unit.

Production of chives per time, there is a capacity of 390 pieces per day. Average total production cost from three recipes is 791.31 baht (calculated from chives at 50 baht per kilogram). The production cost per unit is 2.03 baht per pieces, according to Table 3.

Table 3 The cost per unit

No.	item	production cost	unit	production cost per unit
1	raw materials			
	chives flour	93.98		
	chives filling	290.70		
	sauce	65.97		
2	labor	300		
3	overhead	40.66		
	total	791.31 baht	390	2.03 baht per unit

1.4 The production cost classified by activities relationship.

Three recipes of chives, each recipes has a production capacity of 390 pieces, the price of chives is 50 baht per kilogram, details are as follows:

Recipes 1, fixed cost 300 baht, variable cost 619.63 baht, total cost 919.63 baht, when finished can be sold. Revenue 1,950 baht. Therefore, profit 1,030.37 baht (52.84%), according to Table 3.

Recipes 2, fixed cost 300 baht, variable cost 398.22 baht, total cost 698.22 baht, when finished can be sold. Revenue 1,950 baht. Therefore, profit 1,251.78 baht (64.19%), according to Table 3.

Recipes 3, fixed cost 300 baht, variable cost 456.09 baht, total cost 756.09 baht, when finished can be sold. Revenue 1,950 baht. Therefore, profit 1,193.91 baht (61.23%), according to Table 3.

When average the three recipes of chives it was found that fixed cost 300 baht, variable cost 491.31 baht, total cost 791.31 baht, when finished can be sold. Revenue 1,950 baht. Therefore, profit 1,158.69 baht (59.42%), according to Table 4.

Table 4 The production cost classified by activities relationship (unit: baht)

No.	item	recipe 1	recipe 2	recipe 3	average
1	fixed cost	300	300	300	300
2	Variable cost	619.63	398.22	456.09	491.31
	Total cost	919.63	698.22	756.09	791.31
		(47.16%)	(35.81%)	(38.77%)	(40.58%)
	sales	1,950	1,950	1,950	1,950
		(100%)	(100%)	(100%)	(100%)
	profit	1,030.37	1,251.78	1,193.91	1,158.69
		(52.84%)	(64.19%)	(61.23%)	(59.42%)

2. Calculation of return Business return is measured by performance for the month ending and the year ending, details are as follows:

2.1 Performance for the month ending is presented in income statement form. The details are as follows: revenue 46,800 baht (390 pieces per day x 5 baht x 6 days a week x 4 weeks). Production cost 19,000.80 baht (390 pieces per day x 2.03 baht x 6 days a week x 4 weeks). Gross Profit 27,799.20 baht, selling expenses 1,160.16 baht (48.34 baht per day x 6 days x 4 weeks) (according to table 5). Administrative expenses 429.22 baht, consisting of electricity costs 303.58 baht, water supply costs 75.64 baht, and internet costs 50 baht (according to table 6). The operating income is 26,209.82 baht. No other expenses and interest expenses because no debt in business. Therefore, the net income for the month ended October 31, 2021 is equal to the operating income of 26,209.82 baht as shown in Figure 1.

Table 5 Selling expenses per time (1 Day)

No.	item	recipe 1	recipe 2	recipe 3	average
1	foam box	39	39	39	39
2	plastic	3.36	3.36	3.36	3.36
3	plastic bag	5.98	5.98	5.98	5.98
	total	**48.34**	**48.34**	**48.34**	**48.34**

Table 6 Administrative expenses (per year)

No.	item	recipe 1	recipe 2	recipe 3	average
1	electricity bill	3,248	4,092	3,589	3,643
2	water bill	630	1,284	809	907.67
3	internet fee	600	600	600	600
	total	**4,478**	**5,976**	**4,998**	**5,150.67**

Table 7 APPLE CHIVES SHOP Income Statement For the Month Ending October 31, 2021

Sales		฿	46,800
Less Cost of Goods Manufactured			19,000.80
Gross profit			27,799.20
Less Selling expenses	1,160.16		
Less Administrative expenses	429.22		1,589.38
Operating income			26,209.82
Less Other expenses	0		
Interest expenses	0		0
Net Income		฿	26,209.82

2.2 Performance for the year ending is presented in income statement form. The details are as follows: revenue 608,400 baht (390 pieces per day x 5 baht x 6 days a week x 52 weeks). Production cost 247,010.40 baht (390 pieces per day x 2.03 baht x 6 days a week x 52 weeks). Gross Profit 361,389.60 baht, selling expenses 15,082.08 baht (48.34 baht per day x 6 days x 52 weeks) (according to table 5). Administrative expenses 5,150.67 baht, consisting of electricity costs 3,643 baht, water supply costs 907.67 baht, and internet costs 600 baht (according to table 5). The operating income is 341,156.85 baht. No other expenses and interest expenses because no debt in business. Therefore, the net income for the year ended December 31, 2021 is equal to the operating income of 341,156.85 baht as shown in Figure 2.

Table 8 APPLE CHIVES SHOP Income Statement For the Year Ending December 31, 2021

Sales		฿	608,400
Less Cost of Goods Manufactured			247,010.40
Gross profit			361,389.60
Less Selling expenses	15,082.08		
Less Administrative expenses	5,150.67		20,232.75
Operating income			341,156.85
Less Other expenses	0		
Interest expenses	0		0
Net Income		฿	341,156.85

3. Profitability and rate of return analysis for decision making Margin is a measure of profit compared to sales measured by Gross Profit Margin, Operating Profit Margin, and Net Profit Margin. The measure of profit compared to investment is known as the rate of return is calculated according to the following details. (Taechoyotin, et al., 2014)

3.1 Gross Profit Margin as a proportion of sales after deducting cost of sales called gross profit calculated as follows:

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit} \times 100}{\text{Sales}}$$

$$= \frac{361,389.60}{608,400} \times 100$$

$$= 59.40\%$$

2. Operating Profit Margin as a proportion of sales after deducting cost of sales, selling expenses, and administrative expenses calculated as follows:

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

$$= \frac{341{,}156.85}{608{,}400} \times 100$$

$$= 56.07\%$$

3. Net Profit Margin as a proportion of sales after deducting cost of sales, operating costs, Interest expense, and income tax calculated as follows:

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

$$= \frac{341{,}156.85}{608{,}400} \times 100$$

$$= 56.07\%$$

4. Return on Assets / Return on Investment is ratio indicates investment efficiency. It is a measure of performance compared to the total investment calculated as follows:

$$\text{Return on Assets (ROA)} = \frac{\text{Net Profit}}{\text{Assets}} \times 100$$

$$= \frac{341{,}156.85}{208{,}590} \times 100$$

$$= 163.55\%$$

Discussion

The research showed that the gross profit margin was 59.40%, which portion of profit was sufficient for expenses, businesses do not any problems in their operations. However, the gross margin will be high or low depending on cost of goods sold and selling price. The gross profit margin should be high because it shows the profitability and the cost control. Past research on cost and profitability analysis of cassava cultivation. It was found that the gross profit margin 26.63%. (Wangraj et al., 2021)

This research has shown that the operating profit margin 56.07%. The higher or lower value depending on operating expenses. The amounts reflect

the business's potential to generate operating profit and show about the earnings quality. (Thuwanimitkun et al., 2021) investigated further that operating profit margin on cost and profitability analysis of cassava cultivation was 20.76%.

The results showed that the net profit margin was 56.07%, reflecting the efficient management and reasonable cost control will make the net profit to be at an appropriate level. High net profit means that expenses can be controlled well. However, there are related research findings on net profit margin between 14.71%-60.05% as follows:

Financial benet-cost analysis for potatoes process of chedi mae-krua agriculturist housewives group in mae faek mai district, sansai, chiang mai province found that net profit margin 14.71% (Srihangao, 2018) a cost and return on investment analysis for traders in phayao province found that net profit margin to average 15.19% (Sittijan et al., 2018) analysis of cost and eeturns of rice paddy and secondary rice of farmer in tambon kho chang, mae sai district, chiang rai province found that net profit margin 23.47% (Norkham et al., 2018) cost and compensation analysis of the dyed fabric products of shop operators in thung hoi sub-district muang district, phrae province found that net profit margin to average 33.66% (Duangta et al., 2018) cost and return of cultivation macadamia amphoe khao-kho phetchabun province found that net profit margin 38.21% (Khampian, 2020) the comparison of cost and return in planting green hot chili by using Individual and collaborative farming in pak pha-nang river found that net profit margin 55.93% (Thinnam & Thippayana, 2021) and costs and returns on investment of Japanese soya farmers oil tumbon, pong district, phayao province found that net profit margin to net sales 60.05% (Thonthan et al., 2018)

The results showed that return on investment was 163.55%, meaning that every 100 baht of assets would make a profit of 163.55 baht. This indicates that the business effectively or not. It is a measure of performance compared to the total investment. (Thuwanimitkun, 2020) return on investment or return on assets (ROI or ROA) is a financial ratio that measures profitability shows that how assets or investments profitability after deducts taxes and interest expense. However, there are research related found the rate of return on investment between 17.91-157.87% as follows: a cost and return on investment analysis for traders in phayao province found that return on investment (ROI) 17.91% (Sittijan et al., 2018) cost

and compensation analysis of the dyed fabric products of shop operators in thung hoi sub-district muang district, phrae province found that return on investment (ROI) 50.74% (Duangta et al., 2018) cost and return on investment for Japanese leek farming, san salee sub-district, wiang pa pao district, chiang rai province found that return on investment (ROI) 51.26% (Saklor et al., 2018) cost and return on investment for hmong tribe embroidery in wiang kaen district, chiang rai province found that return on investment (ROI) 51.60% (Nutham et al., 2018) costs and returns on investment of Japanese soya farmers oil tumbon, pong district, phayao province found that return on investment (ROI) 150.32% (Thonthan et al., 2018) and analysis of cost and returns of rice paddy and secondary rice of farmer in tambon kho chang, mae sai district, chiang rai province found that return on assets (ROA) on rice paddy was 114.79% and secondary rice was 157.87% (Norkham et al., 2018)

Body of knowledge

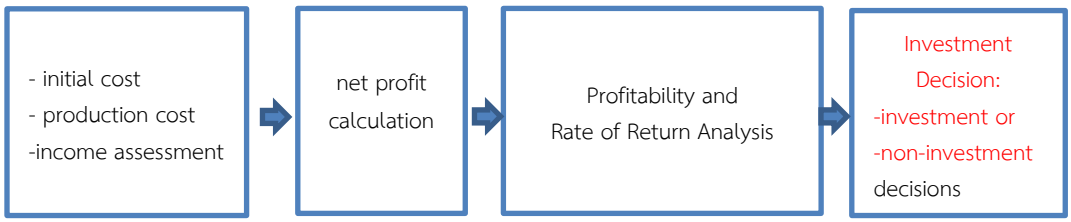

Figure 1: Body of knowledge

Investing for financial success required the initial knowledge, such as initial cost, production cost and rational estimates of revenues will make the calculation of net profit close to reality and analyze profitability from 3 financial ratios: 1. gross profit margin show profitability and ability to control costs 2. operating profit margin show the potential of the business in generating profits and operating efficiency and 3. net profit margin reflect effective management from the control of selling expenses and administrative expenses appropriately. In addition, there is also a rate of return on investment that indicates the ability to utilize assets

profitability. After calculating all the above, entrepreneurs will be able to decide invest or not invest in a business.

Recommendations

1. The results showed that the initial cost does not exceed 50,000 baht, which is not a high cost and interesting to invest. However, nowadays consumer tend to consume more vegetables. There are many customer groups but there are also more entrepreneurs. Therefore, if starting this business should study marketing strategies to make consumers feel that the product is valuable different from other sellers and a variety of distribution channels should be used. Use technology to help sell via the Internet or various applications to be a business driver.

2. Chives which the main raw material, is seasonal fluctuations. Especially in Bangkok, prices are higher than other provinces. Therefore, setting the selling price per unit should be considered according to each area. In addition, the price of chives in each month is different. Selling prices may vary throughout the year. However, raw material prices affect profit margins and rate of return. Hence, the cost should be carefully considered before making an investment decision.

3. The cost and return of organic chives should be studied as they reduce production costs, add value to raw materials as well as creating a difference from other entrepreneur.

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