

Opportunity Analysis of Cow Livestock Investment in Gorontalo

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Abstract

High unemployment rate has encouraged the growth of various business units as job providers for productive age. This study aims to examine the business opportunities of cow farming in Gorontalo region. It uses combination of qualitative and quantitative method. The qualitative method is done by observation and interview. The quantitative analysis is done by calculating cash flow, net present value (NPV), internal rate of return (IRR), benefit cost ratio, and gross margin. The results showed that traditional system of cow farming business by self-management and profit sharing has profitable cash flow, NPV, IRR, BC ratios, and gross margin and worthy for selected. The Cash flow and NPV are positive and IRR level is greater than the required profit level. A semi-modern cow cage system for fattening produces lower cash flow, NPV, IRR, BC ratios, and gross margin. The cages cow breeding produces more attractive cash flow, NPV, IRR, BC ratios and gross margin.

Keywords: investment, cow, fattening, breeding, cash flow, NPV, IRR.

DOI: 10.7176/RJFA/12-22-13

Publication date: November 30th 2021

INTRODUCTION

Background

The growth of available jobs is smaller than the labor force. It causes higher unemployment in productive age. This is a problem faced by government both at national level and regional level in Tomini Bay area without a solution. The Tomini Bay area is a land and sea that can become a resource to drive the people economy. Resource in livestock sector is one of potentials that can be developed as a driver of economic growth.

Gorontalo region supplied cow to Kalimantan in 1980s to 1990s, but now has stopped. This situation illustrates that the production of cow in past is larger than the needs to make this commodity price was lower than Kalimantan area. The region development increases the demand for beef in this region.

The development of livestock business is not proportional with the increase in cow demand. This region cannot longer supplies the cow to Kalimantan. The cow development in this region should be a concerned to fulfill the level of consumption. The cow development can be done by cultivating and motivating people to develop this business.

Cow farming in this region are still developed in a traditional way. The cow breeders develop cow as a side business beside agricultural sector. These breeders use a lot of feed available around their environment, such as straw, banana stems and grass as the main source of feed for their livestock. It can reduce the cost of feed than breeders who rely on purchased feed. There are still many breeders who breed their livestock in a natural way without technology in field of animal husbandry. This is also an obstacle to optimize the cow farming.

The cow breeding has also been partially done with a semi-modern system that already uses cow cage for livestock while the food is provided by livestock owners. This method was done to overcome the narrower land for traditional breeding. The owner must have an adequate source of animal feed to ensure the continuity of his business.

Research Problems

Based on the background, The research problem of this research can be stated below.

1. Analysis the cash flow for traditional and semi-modern cow farming systems
2. Analysis the investment performance in traditional and modern of cow farming system.

LITERATURE REVIEW

The Role of Livestock Business on Breeder's Income

Saragih (2000) divided the typology of livestock business in group. The classification based on the scale of business and income level of breeders is shown below.

1. Livestock as a sideline, the livestock is aimed to increase the income.

2. Livestock as a branch of business, the livestock becomes one of business branches occupied by breeders.
3. Livestock as the main business, the livestock as the main business developed by breeder while other businesses are a side business from breeder.
4. Livestock as a sole business, namely a business that is developed without any other business as an additional business for breeder.

Cow Business Development

Many breeders in this region are breeders who develop livestock independently in limited numbers. Some still rely on traditional system and some have managed it semi-modern by applying simple technology to breed livestock, process animal feed and sell their livestock. In traditional maintenance tradition, there is also a profit-sharing system that can provide benefits for both parties, because the animal owners (capital owners) do not have sufficient time to maintain and supervise themselves, so it is given to parties who are considered capable and allow them to maintain and supervise cow directly and periodically.

The profit sharing creates cooperation between animal owners and breeders. The desire of cow breeders to do their business is constrained by business capital and cow owner gives the capital. It is profit sharing system. This business can contribute income and improve the standard living of cow breeders. The profit sharing system is under an agreement or joint business. An agreement is made for distribution of profits to be obtained between two or more parties. The amount of determination of profit sharing portion between the two parties is determined according to mutual agreement, and must occur with willingness of each party without any element of coercion (Yunianto, 2015). Breeders with small business scales need the support of facilities and role of stakeholders to maintain value chain of beef and beef supply, Zenal Asikin, et al (2020).

Lestari et al. (2017) suggested that a cow farm development should pay attention to availability of feed as a basic capital in business success. The other factor is the ability to increase efficiency in developing a business. Comparative advantage should be utilized and always continue to make improvements to increase competitive advantage.

RESEARCH METHODS

Research Type and Location

This study uses a combination of qualitative and quantitative research methods. The qualitative and quantitative approaches are generally done during identification and exploration. Qualitative was conducted to get information from breeders about the methods used to develop cow business in order to get best practice through benchmarking between one breeder and another.

Quantitative method is used to get information about the costs and benefits in a cow farming business through analysis of investment performance. This research will be done in Gorontalo City and Gorontalo Regency.

Data Source

The data in this study comes from primary and secondary data sources. Primary data source is obtained from interviews with cow breeders about their business methods. Secondary data is collected from related documents, journal and papers.

Data collection technique

Data collection techniques will be used to complement to each other.

1. Observation. Observation techniques are used to get data and information of cow development.
2. Interview. Direct interviews with breeders collect the methods, feed requirements, animal feed collection process, information on costs that must be incurred by breeders both from feed and other supporting facilities, as well as the selling value of cow.

Data analysis

Cost benefit analysis (cash flow) is obtained from interviews with breeders to get information about the amount of income and costs incurred until the cow are sold. Quantitative analysis is done to get an overview of how to assess the performance of an investment using the formula below.

1. Net Present Value

$$NPV = \left(\frac{CF1}{(1+r)^1} + \frac{CF2}{(1+r)^2} + \frac{CF3}{(1+r)^3} + \frac{CFn}{(1+r)^n} \right) - NI$$

This formula calculates the level of cost of capital and cash flow from investment. The investment can be made if the NPV value > 0

2. Internal Rate of Return

$$NI = \left(\frac{CF1}{(1+IRR)^1} + \frac{CF2}{(1+IRR)^2} + \frac{CF3}{(1+IRR)^3} + \frac{CFn}{(1+IRR)^n} \right)$$

This formula is used to equalize the present value of cash inflows and present value of cash outflows. The investment can be done if value of IRR > required profit.

3. R/C Ratio (Return Cost Ratio)

It is the comparison between sales income and the costs during the production process. The livestock business will be profitable if the r/c value > 1. Greater R/C value will increase the profit. The formula to calculate R/C ratio is:

$$RC \text{ ratio} = \text{total income} / \text{total production}$$

Soekartawi et al., (1996) stated that a benefits business has R/C > 1. Greater R/C ratio shows more efficient the business, and vice versa.

4. Gross margin

This formula is reduction between Total Revenue and Total Cost Variable

$$GM = TR - TVC$$

RESEARCH RESULT

A. Traditional cow cultivation system

Traditional cow farming have been developed by community utilizing the available animal feed around the environment. This cultivation is done in a limited number according to ability of breeders to maintain and handle their livestock. Bali cow is most widely practiced cultivation for the easier to breed.

Self-managed cultivation system

Bali cow consist of three female and two cow aged one year. This is an independent community farm where they use grass and other feed during the day. They purchases feed for night such as corn leaves and bran. Assuming that breeder sells bulls that are 2 years old, part of their income cover the cost of feed. The cow care for every year are five heads, this number can still be handled directly by one breeder.

Livestock with this cultivation system will better if supported by garden planted with forage grass such as elephant grass, odot or pakchong. This feed can reduce the cost to increase cash flow than the cash flow shown in table. Cash flow for this cow farming is shown in table 1 and the net present value is shown in table 2.

Table 1. Cash Flow for Self-Managed Cultivation system

Information	CF 1	CF 2	CF 3	CF 4	CF 5	CF 6
Sales revenue	22000000	24000000	24000000	26000000	28000000	3000000
Maintenance Cost:						
Corn leaves	7200000	7400000	7400000	7500000	7500000	7600000
Bran	1800000	2000000	2000000	2000000	2000000	2100000
Vitamin	1200000	1200000	1200000	1200000	1200000	1200000
wages	300000	400000	400000	400000	400000	500000
Total costs	10500000	11000000	11000000	11100000	11100000	11400000
Cash flow	11500000	13000000	13000000	14900000	16900000	18600000

**Table 2
 Net Present Value of Self-Managed Cultivation System**

Year	Cash Flow	1 + Required interest rate (20%)	Present Value
1	11,500,000	1.2	9,583,000
2	13,000,000	1.44	9,027,000
3	13,000,000	1,728	7,523,000.
4	14,900,000	2.07	7,198,000
5	16,900,000	2.49	6,787,000
6	18,600,000	2.98	6,241,000
	Present Value		46,359,000
	Investment Value		34,000,000
	Net Present Value		12,359,000

This project has positive net present value and may be selected. Positive results indicate that total present value based on expected profit level of 20% can still be achieved or even more. This is evidenced by results obtained that present value is still greater than the total value of investment. The total investment is IDR 34,000,000

Table 3
Internal Rate of Return of Self-Managed Cultivation System

Interest Difference	Difference Present Value (PV)	Difference PV with Initial investment
32%	34,525,458	34,525,458
34%	33,018,683	34,000,000
2%	1,506,775	525,458
IRR	$32\% + (525,458 / 1,506,775) \times 2\%$	
IRR	$32\% + 0.69\% = 32.69\%$	

Table 3 shows the IRR of this project is 32.69% greater than the expected profit. Therefore, this project can still be a good choice for breeders.

Return Cost Ratio

Return cost ratio is a comparison between the profit and the costs, as shown in table 4.

Table 4. Return Cost Ratio

year	Return	Cost	Ratio = R/C
1	11,500,000	10,500,000	1.09
2	13,000,000	11,000,000	1.18
3	13,000,000	11,000,000	1.18
4	14,900,000	11,100,000	1.34
5	16,900,000	11,100,000	1.52
6	18,600,000	11,400,000	1.63

Table 4 shows the comparison between return and cost ratio are increase. The breeders can take advantage of feed available in their environment such as grass, corn husks, banana stalks to reduce the cost.

Livestock cultivation system with profit sharing

The cow owners will raise the cow to other people who do not yet have the ability to buy cow. It will make them do not bear the cost of feed. Table 5 shows the analysis of five female Bali cow which are ready to produce. The total investment value is IDR 40,000,000. This system can help those who do not have the ability to buy cow for breeding will get a share of livestock. Meanwhile, livestock owners are not bothered by cost of feed because the animal feed is fulfilled by people who take care of their livestock.

Table 5. Profit Sharing Analysis

Information	Cash Flow 1	CF 2	CF 3	CF 4	CF 5
Breeding income	17,500,000		17,500,000		24,500,000
Fattening income		11,250,000		12,500,000	
Cash flow	17,500,000	11,250,000	17,500,000	12,500,000	24,500,000

Cash Flow Cultivate profit sharing system

Breeding income is earned for one year old cow. The advantage of breeding is that cow up to one year do not require a lot of feed but the economic value achieves 3.5 million. Assuming 5 cow produce 1 cow after one year it becomes IDR 17.500.000 (3.5 million x 5). Female cow at 2.5 to 3 years old will already to produce. Breeder can be get new female cow in 5th year.

Fattening income increase for cow between the ages of 1 year to 2 years is 22,500,000 (4.5 million x 5 cow). The price increase of cow from one year to two years of age is divided by person who takes care of cow. Cow in 2 to 3 years old develop into can be fertilized for female cow and sold to bulls. This cultivation can help breeders who do not have the ability to buy livestock by obtaining livestock from people who have the ability to provide livestock for cultivation. Table 6 shows the Net Present Value of profit sharing system cultivation.

Table 6. Net Present Value of profit sharing system cultivation

year	Cash Flow	1 + Required interest rate	Present Value
1	17,500,000	1.20	14,583,300
2	11,250,000	1.44	7,812,500
3	17,500,000	1.728	10,127,300
4	12,500,000	2.07	6,038,600
5	24,500,000	2.49	9,839,300
Present Value			48,401,000
Investment Value			40,000,000
Net Present Value			8,401,000

This investment has an expected return of 20%. Net Present Value shows a positive value. Therefore, this project can be selected by breeders. Table 7 shows the Internal Rate of Return of profit sharing system cultivation.

Table 7. Internal Rate of Return of profit sharing system cultivation

Interest Difference	Difference Present Value (PV)	Difference PV with Initial investment
30%	40,769,477	40,769,477
32%	37,964,371	40,000,000
2%	2,805,106	769,477
IRR	$30\% + (769,477 / 2,805,106) \times 2\%$	
IRR	$30\% + 0.54\% = 30.54\%$	

The IRR for this project is 30.54%. It is greater than the expected profit. Therefore, this project can be selected by breeders. The project age of five years has IRR rate of 30.54%

Return Cost Ratio and Gross Margin

There is no Return cost ratio and Gross margin in profit sharing system for livestock owners because they do not bear the cost of raising livestock. The cost is fully borne by person who raises the cow.

B. Semi Modern Cow Cultivation.

This cultivation was developed with a cage system. Breeders provide the necessary facilities such as cow pens with livestock manure waste storage and grass chopping machines. Cow feed is provided by breeders, most of which are purchased such as tofu dregs, corn leaves, bran, kale, straw and appetite-enhancing vitamins.

The research samples are fifteen Bali cow and for one year capacity there are two turnovers of domesticated cow. Therefore, the sales for a year are thirty cow. The price for this calculation is under normal conditions. The difference between the selling price and purchase price for fattening for 4 to 5 months is 2 to 3 million. The selling price will higher at Eid al-Adha.

This cow farming cultivation has relatively small cash flow compared to sales turnover from first year to sixth year. The high cost of feed becomes the cause of small cash flow. The farmers should reduce the cost of animal feed by having a feed bank to meet feed sourced from forages such as elephant grass, odot, pakchong, straw, kale. Breeders need to provide land or use unused land to plant grass for their livestock feed.

1. Cow Feeder

The samples are fifteen Bali cow with two turnovers for a year. The sales for a year are thirty cow. The calculation uses normal price of cow. The difference between the selling price and purchase price for fattening for 4 to 5 months is 2 to 3 million, as shown in table 8.

Table 8. Cash Flow Cow Fattening with Semi Modern System

Information	Cash flow 1	Cash flow 2	Cash flow 3	Cash flow 4	Cash flow 5	Cash flow 6
Cow sale	360,000,000	360,000,000	360,000,000	390,000,000	390,000,000	390,000,000
Purchase price	300,000,000	300,000,000	300,000,000	315,000,000	315,000,000	315,000,000
Gross profit	60,000,000	60,000,000	60,000,000	75,000,000	75,000,000	75,000,000
Operation costs:						
Animal feed :						
Bran	6,800,000	6,800,000	6,800,000	6,800,000	6,800,000	6,800,000
Tofu Dregs	9,125,000	9,125,000	9,125,000	9,490,000	9,490,000	9,490,000
Straw	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Corn Dregs	4,000,000	4,000,000	4,000,000	4,400,000	4,400,000	4,400,000
Salt	900,000	900,000	900,000	900,000	900,000	900,000
Mineral	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Medical :						
Drugs	250,000	250,000	250,000	260,000	260,000	260,000
Vitamin	250,000	250,000	250,000	260,000	260,000	260,000
IB						
Transportation:						
Motorcycle petrol	720,000	720,000	720,000	720,000	720,000	720,000
Maintenance	40,000	40,000	40,000	45,000	45,000	45,000
Labor:						
Wages	12,000,000	12,000,000	12,000,000	13,200,000	13,200,000	13,200,000
The amount of costs	36,285,000	36,285,000	36,285,000	38,275,000	38,275,000	38,275,000
Cash Flow	23,715,000	23,715,000	23,715,000	36,725,000	36,725,000	36,725,000

The Net Present Value of semi modern cow fattening system is shown in Table 9.

Table 9. Net Present Value of Semi Modern Cow Fattening System

year	Cash Flow	1 + Required interest rate	Present Value
1	23,715,000	1.2	19,762,500
2	23,715,000	1.44	16,468,750
3	23,715,000	1,728	13,723,958
4	36,725,000	2.07	17,741,545
5	36,725,000	2.49	14,748,995
6	36,725,000	2.98	12,323,825
Present Value			94,769,573
Investment Value			150,000,000
Net Present Value			(55,230,427)

The net present value is negative, indicating that this project does not provide benefits for breeders so it is not a good choice.

The Internal rate of Return for semi modern cow fattening system is shown in table 10.

Table 10. Internal rate of Return for Semi Modern Cow Fattening System

Interest Difference	Difference Present Value (PV)	Difference PV with Initial investment
3%	162,162,187	162,162,187
5%	144,284,773	150,000,000
2%	17,877,414	12,162,187
IRR	$3\% + (12,162,187 / 17,877,414) \times 2\%$	
IRR	$3\% + 1.36\% = 4.36\%$	

The IRR for this project is 4.36% smaller than the expected profit of 20%. Therefore, from IRR point of view, this project should not be selected.

The Return Cost Ratio for semi modern cow fattening system is shown in table 11.

Table 11. Return Cost Ratio semi modern cow fattening system

Year	Return	Cost	R/C ratio
1	23,715,000	36,285,000	$23,715,000/36,285,000 = 0.65$
2	23,715,000	36,285,000	$23,715,000/36,285,000 = 0.65$
3	23,715,000	36,285,000	$23,715,000/36,285,000 = 0.65$
4	36,725,000	38,275,000	$36,725,000/38,285,000 = 0.95$
5	36,725,000	38,275,000	$36,725,000/38,285,000 = 0.95$
6	36,725,000	38,275,000	$36,725,000/38,285,000 = 0.95$

Table 11 shows that the returns obtained by cow fattening with cage system is profitable but still below the expected profit level.

The Gross Margin of semi modern cow fattening system is shown in table 12

Table 12. Gross Margin

Year	Sale	Variable Cost	Gross Margin
1	360,000,000	336,285,000	23,715,000
2	360,000,000	336,285,000	23,715,000
3	360,000,000	336,285,000	23,715,000
4	390,000,000	338,275,000	36,725,000
5	390,000,000	338,275,000	36,725,000
6	390,000,000	338,275,000	36,725,000

Table 12 shows that fattening with this system still gets a gross margin, but the percentage is still small compared to traditional system.

2. Breeding Cow

Cages cow breeding will provide greater benefits than cow fattening. The income earned by one cow up to one year is 3 million to 4 million rupiah, while the feed used is still relatively small. Every cow with good productivity can give birth every year. Four months later the cow is ready to be fertilized. One female for local breeds can give birth to ten or more depending on lust conditions of female cow. Meanwhile, imported cow (limousine) can produce about 4 to 5 cow. Cow that are no longer productive are sold as cow beef. Table 13 shows the Cash Flow of cow breeding with semi modern system.

Table 13. Cash Flow of Cow Breeding with Semi Modern System

Information	Cash flow 1	Cash flow 2	Cash flow 3	Cash flow 4	Cash flow 5
Breeding income	40,000,000	40,000,000	40,000,000	60,000,000	80,000,000
Fattening income		40,000,000	40,000,000	60,000,000	80,000,000
Female fattening			10,000,000	10,000,000	10,000,000
bull sale			20,000,000	32,000,000	40,000,000
Amount	40,000,000	80,000,000	110,000,000	162,000,000	210,000,000
Operating costs:					
Animal feed :					
Bran	4.760,000	5,712,000	7,616,000	9,996,000	10,472,000
Tofu Dregs	6,387,500	7,665,000	10,220,000	13,413,750	14,052,500
Straw	700,000	840,000	1,120,000	1,470,000	1,540,000
Corn Dregs	2,800,000	3,360,000	4,480,000	5,880,000	6,160,000
Salt	630,000	756,000	1,008,000	1,323,000	1,386,000
Mineral	840,000	1,008,000	1,344,000	1,764,000	1,848,000
Medical :					
Drugs	175,000	210,000	280,000	367,500	385,000
Vitamin	175,000	210,000	280,000	367,500	385,000
Artificial insemination	1,250,000	1,250,000	1,875,000	1,875,000	2,500,000
Transportation:					
Motorcycle petrol	720,000	720,000	720,000	720,000	720,000
Maintenance	40,000	40,000	40,000	45,000	45,000
Labor:					
Wages	12,000,000	12,000,000	12,000,000	13,200,000	13,200,000
The amount of costs	30,477,500	33,771,000	40,983,000	50,421,750	52,693,500
Cash Flow	9,522,500	46,229,000	69,017,000	111,578,250	157,306,500

Net Present Value of cow breeding with a semi modern system is shown in table 14.

Table 14. Net Present Value of Cow breeding with a semi modern system

Year	Cash Flow	1 + Required interest rate	Present Value
1	9,522,500	1.2	7,935,400
2	46,229,000	1.44	32,103,400
3	69,017,000	1,728	39,940,400
4	111,578,250	2.07	53,902,500
5	157.306.500	2.49	63,175,300
Present Value			197,057,000
Investment Value			100,000,000
Net Present Value			97,057,000

Table 14 shows the net present value with a positive value of IDR 63.523,698. This means that the project can be chosen as an alternative investment that can provide benefits for breeders. Internal Rate of Return for cow breeding financing with a semi modern system is shown in table 15.

Table 15. Internal Rate of Return for cow breeding with a semi modern system

Interest Difference	Difference Present Value (PV)	Difference PV with Initial investment
30%	113,499,432	113,499,432
35%	93,913,787	100,000,000
5%	19,585,645	13,499,432
IRR	$30\% + (13,499,432 / 19,585,645) \times 5\%$	
IRR	$30\% + 3.44\% = 33.44\%$	

Table 15 shows the IRR is 33.44% for this investment. It indicates that the project is feasible to choose because the IRR is greater than the expected return rate of 20%. The Return Cost Ratio of cow breeding with a semi modern system is shown in table 16.

Table 16. Return Cost Ratio cow financing with a semi modern system

Year	Return	Cost	R/C ratio
1	9,522,500	30,477,500	9,522,500 / 30,477,500 = 0.3
2	46,229,000	33,771,000	46,229,000 / 33,771,000 = 1.36
3	69,017,000	40,983,000	69,017,000 / 40,983,000 = 1.68
4	111,578,250	50,421,750	111,578,250 / 50,421,750 = 2.2
5	157.306.500	52,693,500	157.306.500 / 52.693.500 = 2.98

Gross Margin cow financing with a semi modern system is shown in table 17.

Table 17. Gross Margin of cow breeding with a semi modern system

Year	Income	Variable Cost	Gross Margin
1	40,000,000	30,477,500	9,522,500
2	80,000,000	33,771,000	46,229,000
3	110,000,000	40,983,000	69,017,000
4	162,000,000	50,421,750	111,578,250
5	210,000,000	52,693,500	157.306.500

DISCUSSION

Traditional cattle farming

The two cattle farming traditional systems of managed by owners themselves and profit sharing system provides an attractive cash flow value from year to year. A self-managed system can increase the cash flow, but it has limitations where a breeder can raise only five cow. It creates problems if the breeder has more cow.

The two cow farming traditional systems have a positive NPV value and profitable choice. The net present value at an interest rate of 20% provides greater results than the investment value. The internal rate of return in these two models shows a greater value than the expected interest rate. Therefore, this investment is still a profitable choice. In addition to NPV and IRR, the benefit cost ratio and gross margin analyses also show a very attractive value as an alternative investment for breeders.

The cow that can be developed with this model are relatively limited due to ability of breeders to manage livestock. Therefore, the breeder needs land to plant animal feed if this model is developed into a cow husbandry investment model. This method can increase the efficiency of costs incurred by breeders to meet forage sources of feed.

Semi-modern system of cow farming

This system provides a smaller rate of return than traditional. The cow cultivation can be done by fattening and breeding. The cow fattening will produces a relatively small profit. The high cost of feed is the cause. The cash flow is relatively low , negative net present value , internal rate of return of 4.36% is lower than the expected profit of 20%.

The breeders can reduce the cost of animal feed with feed bank to meet feed sourced from forages such as elephant grass, odot, pakchong, straw, kale and corn leaves. Breeders should have land to grow grass for their animal feed. The grass is easier to cultivate compared to corn so that it can reduce the cost of animal feed which dominates maintenance costs. The straw can reduce feed costs by utilizing abundant straw at harvest time. Gorontalo still has a lot of straw that has not been used as animal feed. The availability of cheap feed can increase the cash flow .

Breeders can ferment the straw during the harvest season and stored as feed reserves. Fermented food is used for fattened cow, while breeding cow should use forage feeds to reduce the risk of lower livestock productivity. This feed cost savings can increase cash flow along with lower feed costs.

The livestock entrepreneurs can sell their livestock directly to buyers to increase potential income. This direct selling can increase the expected profit margin, considering the range between the selling price of cow at breeders and traders is in range of 500 thousand rupiah to 1 million rupiah. Breeders can also buy livestock directly from other breeders to get a cheaper price than cow brokers.

Cages is needed for cow breeding. It will provide greater benefits than fattening. The potential income for one cow up to one year old is 3.5 million to 4 million rupiah, while the cost of feed is still relatively small. Cow with good productivity can give birth every year and four months later the cow is ready to be fertilized.

One female cow for local breeds can give birth to ten or more depending on lust conditions of female. Meanwhile, imported cow can produce about 4 to 5 times. Cow that are no longer productive are sold as cow beef. The feed cost dominates the cow farming. Therefore, the feed bank will save the cost of cow breeding and fattening. Lestari et al. (2017) stated that a cow farm development should pay attention to availability of feed as a basic capital in business success. Another important factor is the ability to increase efficiency in developing a business.

CONCLUSION

This study shows that Bali cow that are most widely developed by traditional and semi-modern breeders. This cow is ease develops and the market price can be reached by most consumers so it is also easy to market.

Most of existing breeders carry out livestock breeding either naturally or artificial insemination. The application of this technology can speed up the breeding process for very productive and every year the breeder can get new cow from each female. Cow farm with breeding models is more profitable than cow for sale. Breeding will provide better cash flow, NPV value is positive and IRR is greater than the required level of profit.

Cow cultivation using semi-modern fattening methods produce a negative NPV value, and IRR was smaller than the expected profit level. The traditional cultivation with self-managed cow has better investment performance. Breeders can utilize the feed available in their environment to reduce the cost.

Traditional cultivation with a profit-sharing system has good investment performance and very interesting to apply. The people who have the ability to provide livestock can help poor people who have the desire to raise livestock but do not have the ability to buy cow. This system gives them the opportunity to have livestock. The breeders of semi-modern and traditional methods should uses productive cow breeding to provide a high level.

Breeders should have land to plant fodder such as odot, pakcong or elephant grass which is easy to grow as the main source of feed for their livestock in addition to use straw with concentrate addition to increase the cow growth, both for breeding and fattening. The land for feed sources can increase efficiency to save the feed costs.

Research limitations

1. All breeders do not have financial records from year to year. This research is based on data from observation and interviews with breeders in base year to become a projection of average increase from year to year.
2. This study does not take into account the inflation rate and risk of dry season which has an impact on feed price from forage.

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