Farmer Group Performance Bali Cattle In Luwu District East : The Economic Analysis

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Abstract

This research was conducted in the District Mangko Tano East Luwu in South Sulawesi Province, in 2017. The area of research is supported by oil palm plantations, palm plantations, agricultural land, forestry land, vacant land that has not been explored by farmers and other vacant land. The study was conducted by the method of field survey, according to information from the local Animal Husbandry Department, the criteria in the data is the cattle population in farmer.The purpose of this study was to determine the economic analysis on a group of cattle ranchers. Primary data and secondary data were analyzed using descriptive tabulation, quantitatively and economically. The results of the research effort shows that beef cattle, ranchers group profit amounted Rp.3.637.500/year, Agung Sindo Village B/C ratio of 1.2, Kalaenaliri village of Rp.3.886.000/ year ratio B/C 1.2, and the Wanasari Village of Rp.3.788.000/year and ratio of B/C 1.2. Forage in locations very research support to the development of beef cattle Bali. But farmers are accustomed way of raising beef cattle between 2-4 head/breeder, so it needs additional maintenance business scale between 5-10 cattle/livestock farmers, so that the business more effectively and efficiently and economically will benefit farmers.

Key words : Bali cattle rancher performance, economy

Background

South Sulawesi Province as much as 1,353,914 individuals (Directorate General of Livestock and Animal Health (2015). System maintenance beef cattle in Indonesia, almost 80% are still sought by small farmers (farm people) that developed in rural areas by means of traditional semi-intensive (Yusdja and Ilham 2004). Enterprises cattle are the most important components in the farming of livestock community, for the maintenance of beef cattle Bali on a small scale, can help the economy for groups of farmers with the utilization of natural resources available in the vicinity. biologically beef quite productive and adaptive to the environmental conditions agro- ecosistem in South Sulawesi, making it easier method development. Cattle development can be directed out of Java, considering the amount of natural resources is very considerable potential, besides that it also will be faster development, (Ahmad, et al., 2004); and (Suryana 2009). The bias of cattle as well as a commodity that is maintained by a group of farmers serves as a main source of income and savings, apart from the results of operations and other food crops.

Usually the challenges often faced by each breeder cattle are supplying feed very less, when the dry season (Rusdiana and Adawiyah 2013). Subdistrict Mangko Tano East Luwu Regency on the contrary, waste agricultural plentiful and many are not utilized as animal feed, because the land area and the number of cattle farms wider maintained.Each breeder beef cattle forage plant in the land own, cultivated land area of 1-2 ha forage, forage cultivated elephant grass and other weeds that can meet needs fodder. The availability of agricultural land, vacant land plantations, fields, rice paddies and fields and other land, which is land with the potential to provide good forage grasses or agricultural waste enough variety available. But many bleak agricultural waste rice straw and other crops is not utilized by many farmers as feed for cattle, (Widaryati.2010). Based on the problems mentioned above need to do research on beef cattle business, in addition to businesses and other staple food crops, may be seen as a beef cattle business commercial business or core.

Research purposes

Business development, in which case all forms of government social aid to groups of farmers are monitored by the Department of Agriculture, Animal Husbandry Extension and East Luwu in South Sulawesi. Help Bali cattle mature females, productive ready to mate as many as 150 animals and adult male ready to mate 20 head for the group. Total of members in each group between 19-22 people farmer. Beef cattle are kept still counted as initial capital. Management is done jointly with the members of the group coordinated by the group management and local extension agents. Rearing sharing according to the rules that have been agreed. General overview to determine the activities of groups of farmers economic activity, will be in an analysis of beef cattle production Bali. Availability of factors that affect the economic behavior of farmers and livestock prices, as well as the effect of changing economic environment farmers against the risk conditions of livestock production and influence prices.

The purpose of this paper is to see how well a group of cattle ranchers in the economic analysis. Estimated effort cattle on farmers Assumption or Estimates, this can be done the way the assessment with the assumption, prices, costs, sales and market prices. A measure to do based on quantitative data from or to the level of accuracy, and can be measured by numbers. An approximate estimation of the financial analysis effort Bali cattle were recommended by a group of cattle ranchers in the East Luwu regency of South Sulawesi. This, is an estimate to determine the benefits of beef cattle breeders group with intensive way. If the costs incurred by farmers groups and certainly not excessive, then the farmer will benefit approximate estimate can be predicted in the real benefits, so that farmers benefit each year will increase, (Rusdiana *et al*. 2014). This assumption is rare because usually of one adult female head of cattle will produce a child of at least one head/year. Meanwhile, when the effort to fattening cattle could be

predicted by the time period between 2-3 times the production or harvesting.

In the next period, the venture capital in incurred by the farmer will wane, for the production of feed and the cost of labor alone. The number and value of purchasing cattle reared Bali calculated based business for one year, the number of children produced. Calculation of benefits cattle farmers groups yet a number of rill, before the value of spending during a business is calculated and deducted by the cost of production. If the farmer has not made the sale of livestock for one year or for maintenance, calculation estimation as a shadow. Look at the feasibility of the cattle in groups of farmers in East Luwu regency of South Sulawesi, will be seen the value of sales earned in the real economy in the calculation of B/C ratio. According to Hadi and Ilham (2002), there are some factors of production can be optimized by farmers groups, such as labor costs, feed costs and other expenses incurred, however, can also be eliminated, as the cost of which is uncertain.

Forage as a matter of breeders, in conducting the business of cattle, when approaching dry season, forage slightly reduced, so that farmers are forced to look for grass to another location, so it needs to be calculated labor costs farmers. Livestock farmers cultivate farmland and find their own food, then by itself livestock farmers will reduce the amount of the value of the costs incurred by farmers. Costs can be as small as possible, so that expenses can be optimized according to the number and capacity of the cattle are kept. Cattle business development is deemed highly suitable in the condition of agricultural land, because cattle are known adaptable to the various agro-ecosystem conditions of the rural environment, as well as a complementary effort in a system of crop farming Syamsu (2003) and Winarso et al., (2005). Where the business concept developed by all breeders breeding Bali cattle, with enterprise-based group using a sample of Simantri program, where in the program group received Social Assistance (Bansos) for the development of Bali cattle

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MATERIALS AND METHODS
The location and timing of research

The study was conducted in the District Mangko Tano East Luwu regency of South Sulawesi in 2017. The research location has a pretty good agro-ecosystem for the development of Bali cattle business, research conducted by the method of field survey, the group of cattle ranchers Bali, a group of farmers Village Agung Sindo, and Village Kalenaliri and Village Wanasari in one sub-district (District of Mangko Tano), all groups of farmers keepers beef Bali, selected location with the carrying capacity of oil palm plantations, palm plantations, cocoa plantations, coffee plantations, plantation forestry belongs private and government owned, agricultural land, vacant land that has not been explored by farmers and other vacant land

Business Feasibility Analysis of Beef Cattle

Location of the study in accordance with the information obtained from the Department of Animal Husbandry and Animal Health Luwu Timur, South Sulawesi Province, the criteria to be analyzed from the business of cattle Bali as that is, the pattern of maintenance, the amount of livestock ownership, how marriage, the price of feed location, labor costs farmers and selling value of Bali cattle. The primary data obtained through interviews with respondents directly in the field, referring to the questionnaire has been prepared, while secondary data obtained from the local Department of Agriculture and Animal Husbandry.

Research data from field survey is processed, so that the economic value in the group of beef cattle breeders Bali can be known benefits, by the use of Rp/farmer/ year), which is based on the difference between revenue and expenditure (Cost and analysis). The revenue can be defined as the difference between revenues and total costs incurred during ongoing effort. Then the data is tabulated descriptive, quantitative and economic analysis B/C, according to (Soekarwati, 1995); Hermawan (2012); (Atmakusuma *et al*. 2014), and (Rusdiana *et al*. (2016), using the formula:

The formula: $Y = P + Q - M - N - O + J$

Information:

Y = net income of beef cattle Bali business results (Rp/year)

P = the value of beef Bali at the end of the year (Rp/year)

Q = the value of Bali beef cattle sold of the year (Rp/year)

M = value of beef Bali at the beginning of the year (Rp/year)

N = the value of beef Bali when purchasable (Rp/year)

O = beef Bali maintenance costs (Rp/year)

J = value of net profit (Rp/year)

The formula: $O = TFC + TVC$

Information:

O = the maintenance costs of beef cattle for a year(Rp year)

TFC = Total fixed costs (Rp year)

TVC = Total variable costs (Rp year)

The necessity of to know the value economic viability, good for agriculture and livestock, (Ashari *et al* 2013.): and (Rusdiana *et al* 2016). Based farsial factors and indicators of financial analysis Bali beef cattle business, economically predictable benefit farmers for one year as a rill. The magnitude of the production costs for livestock farmers, of course, labor can be calculated based on labor time livestock farmers for one year using research results, (Rusdiana *et al*. 2010). In the normal working livestock farmers day 5 hours was calculated 1 Hok, the amount of the allocation of labor can be calculated from the total receipts (cash and non-cash) for one year divided by total outpouring of labor (Hok) for one year, Rusdiana et al., (2009) and (Rusdiana *et al*. 2016).

During this time almost all livestock farmers do not ever count the cattle business labor costs, so profits are not visible rill farmers. This means that economic analysis effort bali cattle in principle shown to achieve maximum benefit with the management methods as well as possible. As with any business engaged in the production, the advantages of the

maintenance effort Bali cattle can be determined by the reception and production costs. Then the primary data and secondary data analyzed economically in the form tables and discriftip.

Results and Discussion
The general condition the area

South Sulawesi's population by 2016 as many as 8,342,047 inhabitants with a density of population of 343 793 inhabitants/km distribution of the population in each district were still in the group of 150-300 people/km2, in the East Luwu regency categorized and classified as moderate dense population of approximately >134 people/km2, while the population employed in agriculture is almost about 90% and the rest as traders, clerks and others (Agriculture and Livestock of South Sulawesi,.2016). The government promoted the business community for beef cattle, because cattle are thought to the welfare of farmers. Labor and natural resources that can be utilized optimally, so that the population will be more balanced deployment of the standard of living of farmers or communities would be increased welfare.

It can be seen from the purpose of fostering and development of beef cattle farmers in Bali in group Mangko Tano District of East Luwu regency in South Sulawesi Province, among others, to help the farmers in the provision of agricultural inputs and livestock. To increase farmer incomes and can create jobs. As a seed provider and beef cattle as well as to increase the cattle population to support Siwab program in South Sulawesi Province, and consumer needs of livestock or meat.

Empowerment of of cattle farmers

Land use showed that palm oil plantations, forestry land and vacant land that has not been explored by the owner, the biggest part in the area of South Sulawesi, then mixed farms and paddy fields. This situation illustrates that the area is the East Luwu regency estates in the form of cattle farming, paddy, vegetables, and other crops. Thus most of the farmers, subsistence

farmers have cattle Bali., In addition to farming other crops. Bali beef cattle business, too, is a business that is more involved in the farming community. The number and type of livestock that are commonly is Bali cattle, buffaloes, goats, sheep, chicken, chicken, duck, (Disnak Luwu Timur 2016). Attempts to create resource farmers in East Luwu regency, to the fullest and was instrumental in providing information about the technology of the maintenance effort Bali cattle ranchers group, through guidance from a local farm extension workers and other agencies.

Bali cattle ranchers group is able to improve the insight and knowledge in developing businesses with good cattle. Indirectly economic growth Bali cattle ranchers group pretty well. Basically through improving the quality, quantity, production and productivity of beef cattle farmers groups Bali as well as the management of cow manure waste into organic fertilizer that is effective and efficient in its use as an agricultural fertilizer. The success of an program of agriculture and livestock can not be separated from their agricultural extension programs and livestock and intensive assistance that is characterized by active involves participation of the main actors (groups of cattle ranchers Bali and the role of agricultural extension workers and farms in) as well as businesses cattle. Bali cattle are generally between 2.4 to 6.5 years of production, from the Bali beef cattle breeding can produce as many children as one head/year. Parent body weight Bali beef cattle is estimated between 200-285 kg of live weight.

The success of livestock development in East Luwu regency in particular commodity Bali cattle, rather than determined by the conditions of its natural resources, but also influenced by the role of the extension, the community and the quality of human resources itself. Agricultura extension workers is already time to start to improve itself by taking into account past experience to re-organize the tasks and functions as a companion, facilitator, motivator and even, as a carrier

of aspiration for the group of breeders of beef cattle or farming communities (technology transfer), through engineering appropriate technology, so that it can respond to the challenges of the present and future. Changing the pattern of raising beef cattle traditionally been a commercial, while the orientation of the system development of appropriate technologies resulting, extensive oil palm plantations, and other cropland, which is still enough to accommodate cattle Bali, both businesses with the aim of cultivating produce calves or how grazing (meat). Prices of cattle Bali each year increased, raising cattle is not dependency on the season, the land area of the cage, and does not require too much manpower, so that would guarantee labor efficiency and reduce cost, for the group of cattle ranchers Bali.

The result obtained is a quality product and be able to penetrate the market inside and out. From these conditions, the Department of Agriculture, Livestock, Animal Health and Counseling East Luwu in South Sulawesi implement program activities Technology Application Extension Agriculture and Livestock IB, Appropriate. Commodity Bali cattle in South Sulawesi current program goals Siwab, Cow Mandatory Parent pregnant, which can empower farmers beef cattle, through information technology and agricultural and livestock, which includes community groups on a group of cattle ranchers. The necessity empowerment of Bali beef cattle farmers in East Luwu regency of South Sulawesi with through guidance and mentoring. In order for beef cattle business technology based IB application for commodity beef cattle can be contributed by palm oil and other plantations. Covers the technical aspects of the organization, a group of farmers and cattle ranchers group characteristics. Measured by the number of members of groups of farmers parameter, the number of animals kept by a group of cattle ranchers look at Tabel.1 Bali.

Table 2. Groups of beef cattle farmers in Sub Mangku Tano South Sulawesi

Description	Number	Group	Number/head
Agung Sindo village district Tano Mangku	19	Lembu Jaya	45
Kalaenaliri village district Tano Mangku	22	Tunas Mandiri	53
Wanasari village district Tano Magku	20	Tunas Harapan	62

Utilization of forage in the research sites

The research location is an area of oil palm plantations, cacao plantations, coffee, food crop land, dry land and other land. Each location agro-ecosystem research has the same land. The location of the equation is to have feed for beef cattle are pretty much to the needs of Bali cattle farmers kept by each. Each group of cattle breeders had between 2-4 head/ farmer and generally in are housed In accordance with the opinion of the Goddess and Mairika, (2008), that forage is the food great and small ruminants, thus the necessity of providing fodder throughout the year and suffice sustainable livestock of forage fodder superior needs to be improved, while the forage ahead already widely known by the breeders of beef cattle, such as elephant grass, the grass braciria, Gliricidia, grass fields, king grass, field grass, lawns racket, grass roomy, residual agricultural waste and grasses and other compatriots. But the location of research, farmers cultivate forage is grass elephants and Hawaiian grass. Maintenance of cattle in groups of farmers in recent years, the scale of maintenance still remain between 2-4 individuals/farmer. Nevertheless, the business is very real and can be the attention of the local government, almost all the way groups of farmers raising cattle stabled.

Mastery of cattle on farmers

Expanse of oil palm plantations there are many forage grass and agricultural residue that can be used as cattle feed beef

cattle. However, farmers rarely use, only occasional breeders take it. Beef cattle ranchers are eager to maintain a pet animal as a primary business or as an additional business income from the main business of farming. Number of cattle kept by farmers groups from year to year, a relatively small increase, farmers maintain semi-intensive (traditional), and two groups of farmers by way of maintenance intensive fattening. The mean control of cattle, which are maintained by groups of farmers shown in Table 2. Expanse of oil palm plantations there are plenty of forage grasses and agricultural waste residue that can be used as cattle feed beef cattle. However, farmers rarely use, only occasional breeders take it. Beef cattle ranchers are eager to maintain a pet animal as a primary business or as an additional business income from the main business of farming. Number of cattle kept by farmers groups from year to year, a relatively small increase, farmers maintain intensive (traditional). The mean control of cattle, which are maintained by groups of farmers shown in Table 2.

productive adult females, while adult males very less, while the time for marriage made through IB and natural mating. For beef cattle males and females who are not productive are still maintained for the time being certain to be raised in order to increase body weight gain, high livestock sales value. However, the role of cattle are cattle farming with the highest revenue contribution, the results of food crops of rice.

This further strengthens the evidence that components of beef cattle in the business more robust and adaptable to the environment in addition to components of other crops.Work time beef cattle breeders in Luwu Timur, showed that family labor devoted to the cattle raising efforts do not increase linearly. Each of these cattle ranchers maintain between 2-4 head/farmer, the calculation of working time calculated breeder 5 hours 1 (one) Hok, (Rp/Hok/year). Balance labor costs family cattle ranchers between 20.000-35000/day 5 hours in the calculation shown in Table.3.

Table 2. Mean mastery of beef

Group of farmers	Rearing	Dominat	Feeding	Labor	scale /head
Sindo Agung Village	intensive	Bali Cattle dominant	Grass and plant waste	family	2-4
Kalenaliri Village	intensive	Bali Cattle dominant	Grass and plant waste	family	2-4
Wanasari Village	intensive	Bali Cattle dominant	Grass and plant waste	family	2-4

Tabel.2. The show that, all farmers in almost the same intensive maintenance or cages, with feeding grass produced by farmers by planting in the land own property. The land area planted elephant grass median between 0.01-0.02 ha, and sometimes given other agricultural wastes. Cattle breeders of cattle that are currently

Tabel.3. The average working time cattle rancher

Type of work	The village farmers group sindo aagung (n-19)					
	hours /day	%	average n-19	year / day (360)	5 Hok 1 hour	Rp./year (10.000)
take forage in shepherd	45,6	63,16	2,4	864/5	172,8	3.456.000
	-	-	-	-	-	-
livestock care	26,6	36,84	1,4	540/5	108	2.160.000
Total	72,2	100	3,8	1.268/5	273,6	5.472.000

Type of work	The village livestock farmers group Kalaenaliri (n-20)					
	hours / day	%	average n-20	year / day (360)	5 Hok 1 hour	Rp./year (10.000)

take forage	48	64	2,4	850/5	172,8	3.456.000
in shepherd	-	-	-	-	-	-
lives tock care	27	36	1,4	504/5	100,8	2.016.00
Total	75	100	3,8	1.368/5	273.6	5.472.000

The village livestock farmers group Wanasari (n-22)						
Type of work	hours / day	%	average n-22	year / day (360)	5 Hok 1 hour	Rp./year (10.000)
take forage	52,8	63,16	2,4	864/5	172,8	3.456.000
in shepherd	-	-	-			-
lives tock care	30,8	36,84	1,4	504/5	100.8	2.016.000
Total	83.6	100	3,8	1.368/5	273.6	5.472.000

Description: 5 hours is calculated by 1 (Hok) Rp.20,000

Table. 3. The show that almost all the farmers in performing their work activities to take the grass in their own land as much as 2.5 hours/day, while more work time for feeding and caring for livestock as much as 1.4 hours/day. Supervision of beef cattle do well at night, especially when the cows that are pregnant parents. The result of the calculation of working time is almost the same in his time activity. Show labor productivity in beef cattle farmers groups in the East Luwu regency of South Sulawesi seen in groups of farmers:

1. Groups of farmers in the village of the District Village Sindo Magku Tano invitation intensive way of maintenance, the costs incurred for labor breeder of Rp.5.472..000 / year or as much as 273.6 Hok/year. A lot of time be spent on beef cattle business is to take out the grass as much as 172.8 hours/day/year and to take care of the cattle as much as 108 hours/day/year.

2. The group of farmers in the village of the District Kalaenaliri Mangku Tono by way of intensive maintenance costs. Costs incurred for workforce breeder Rp.5.472 million / year or as much as 273.6 Hok/year. The time used for beef cattle business is to take out the grass as much as 172.8 hours/day/year and to take care of the cattle as much as 100.8 hours/day/year.

3. Groups of farmers in the village of the District Wanasari Mangku Tano invitation maintenance intensive way. Costs incurred for workforce breeder of Rp.5.760.000 / year or as much as 273.6 Hok/year. A lot of time be spent on beef cattle business is to take out the grass as much as 172.8 hours/day/year and to take care of the cattle as much as 100.8 hours/day/year

On the work time that is used by farmers have no effect on a side job.Breeders were delighted in doing their work activities, cattle as much effort hailed by all farmers, ranchers were delighted maintain cattle because it is easy to look for food, it is easy for sales and easy to maintain as well as cow dung or cage can be returned to agricultural land farmers themselves for the fertility of their crops.

Socioeconomic farmers

Enterprises of cattle in groups of farmers is one of the supporters of beef self-sufficiency program, either through artificial insemination (AI) or natural mating. Plan of the Ministry of agriculture today is Siwab goal is to improve the beef cattle population in Indonesian.Given the activities Siwab is implemented using a special effort, it is expected that the development of performance that includes the number of cattle in the IB, and natural mating pregnant and giving birth as well as aspects of the

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technical working more can be informed quickly and in real time use of instruments and development of system modules SMS monitoring and reporting to the Ministry of Agriculture. The achievement of the target population of beef cattle on finally be sufficient meat coming years. Particularly with regard to beef cattle farmers groups to obtain optimum benefit value as expected by all farmers. The social aspect of the existence of cattle breeders in this group, too, is an important thing and should be considered that groups of farmers can maintain slag beef cattle business.

However well a beef cattle development program, and if the social aspect in particular breeder acceptance to the program is not good, then the program does not benefit him. For that immediately thrust towards busine commercial nature both in terms of price and in terms of the market. The achievement of the target population of beef cattle on finally be sufficient meat coming years. Particularly with regard to beef cattle farmers groups to obtain optimum benefit value as expected by all farmers. The social aspect of the existence of cattle breeders in this group, too, is an important thing and should be considered that groups of farmers can maintain slag beef cattle business. However well a beef cattle development program, and if the social aspect in particular breeder acceptance to the program is not good, then the program does not benefit him. For that immediately thrust towards commercial business both in terms of price and in terms of the market.

Economic analysis of beef cattle business

Economically financial can be calculated based on the business and the amount of capital issued. When the initial capital of <50 million / maintenance period, either farming or fattening, intensive or semi-intensive economy can be said to be micro-enterprises. When the capital used for beef cattle business by>100 million, can be said macro economic enterprises, under a wide impact on both institutionally and socially in the community. Bali beef cattle business on a group of farmers of this, that,

the cash received only concentrated on the sale of cattle per year and not allocated sales manure. For a while manure is returned to agricultural land. Technical field, that the beef cattle business is economically profitable, in view of the feasibility of their business. Breeders do not spend capital to buy seeds Bali beef cattle. Seed can be the provision of grants or local government (the Minister), the calculation by the administration of 1-2 cattle/livestock farmers, ranchers restore 1-2 pups or parent in accordance with the collective agreement.

Coefficient technically cattle can be measured through some data that will need the following, the variables below is almost similar to the results of research (Rusdiana *et al*. 2016). Bali cattle for productive seedlings ready to mate early age maintained by groups of farmers with the average age of 12 months, beginning maintained by each parent breeder 4 heads.Based on economic calculations beef cattle business in 1-2 years development own cows can produce death of a child and parent assumptions considered 0% by breeders. Maintenance of Bali beef cattle for the production process to produce children who can be kept until the child reaches the age of approximately 8-12 months. Based on the calculation of business economics in the development of beef cattle cows 1-2 years has been able to produce child and parent mortality assumptions considered 0% by breeders. Maintenance of Bali beef cattle for the production process to produce children who can be kept until the child reaches the age of approximately 8-12 months.

Assuming prices for beef between Rp.8.000-9.000.000/head and the selling price of the parent or a seed that has been maintained for 1-2 years Rp.10.000.000-12.000.000/head. The sale value of male and female child aged 3-5 months for Rp.3.000.0000-5.0000.000/ head. Assumptions assumed the cost of purchasing feed into the labor force farmers. Depreciation assumed cage for 5 years. Equipment enclosure and drug-Obata assumed to be added to the production cost of consumables, gross revenue to subtract the costs for maintenance. The results of the

survey research field, discussed and assumed scale beef cattle business on a group of farmers intensively look at Tabel.4, 5 and 6

Tabel.4. economic analysis Bali beef cattle business intensively (village Sino Agung n-19)

A description	Volume	Mean price (Rp)	Total (Rp)
A. Investment Costs and Depreciation			
- torch cattle (unit)	1 unit	1.850.000	-
- cage/5 year	-		370.500
- equipment and enclosures (package)	1 unit	120.500	120.500
Total			490..500
B. variable costs			
- value buy seeds females age 2.8 years	2 head	8.450.000	17.500.000
- family labor (Hok)	288 Hok /year	20.000	5.472.000
- Forage (kg)	-	-	-
- medicines (packet)	1 packet	30.000	30.000
Total			22.972.000
Total (A + B)			23.462.500
C. Bali cattle sale value			
- the sale value of the adult females 4.3 years	2 head	9.550.000	19.1000.000
- the sale value of male-female	2 head	4,000.000	8.000.000

child aged 3-5 months

- Total gross revenue / year	27.000.000
- Total net income / year	3.637.500
- B/C	1,2

Tabel.5. Economic analysis Bali beef cattle business intensively (Village Kalaenaliri n-20).

A description	Vollume	Mean vrice (Rp)	total (Rp)
A. Investment Costs and Depreciation			
- torch cattle (unit)	1 unit	1.507.500	-
- cage/5 year	-		301.500
- equipment and enclosures (package)	1 unit	105.500	105.500
Total			312.000
B. Variable costs			
- value buy seeds females age 2.8 years	2 ekor	8.150.000	16.300.000
- family labor (Hok)	273,6	20.0000	5.472.000
- Forage (kg)	-	-	-
- medicines (packet)	1 pacet	30.000	30.000
Total			21.020.000
Total (A + B)			22.114.000
C. Bali cattle sale value			
- the sale value of the adult females 4.3 years	2 head	9.200.000	18.500.000
- the sale	2	3.750.000	7.500.0

value of head male-female child aged 3-5 months	00
- Total gross revenue / year	26.000.000
- Total net income / year	3.886.000
- B/C	1,2

Tabel.6. The economic analysis Bali beef cattle business intensively (Village Wanasari n-22)

A description	Volume	Mean price (Rp)	Total (Rp)
A. Investment Costs and Depreciation			
- torch cattle (unit)	1 unit	1.765.000	-
- Enclosures / 5 years	-		353.000
- equipment and enclosures (package)	1 unit	100.500	100.000
Total			453.000
B. Variable costs			
- value buy seeds females age 2.8 years	2 head	8.350.000	16.700.000
- family labor (Hok)	273,6	20.000	5.472.000
- Forage (kg)	-	-	-
- medicines (packet)	1 pacet	40.000	30.000
Total			21.020.000
Total (A + B)			22.212.000
C. Bali cattle sale value			
- the sale value of	2 head	9.450.000	18.900.000

the adult females 4.3 years

- the sale value of male-female child aged 3-5 months	2 head	3.550.000	7.100.000
- Total gross revenue / year			26.000.000
- Total net income / year			3.788.000
- B/C			1,2

Fodder generated by the farmers own planter result. The land area planted elephant grass median between 0.01-0.02 ha, and sometimes given other agricultural wastes. Cattle breeders of cattle that are currently productive adult females, while adult males very less, while the time for marriage made through IB and natural mating. For beef cattle males and females who are not productive are still maintained for the time being certain to be raised in order to increase body weight gain, high livestock sales value. However, the role of cattle are cattle farming with the highest revenue contribution, the results of food crops of rice. This further strengthens the evidence that components of beef cattle in the business more robust and adaptable to the environment in addition to components of other crops. Table. 4, 5 and 6 shows that, between the estimates sales price cow on the market and at about the same middlemen

Each breeder is assumed to get the benefits almost the same. Advantages Sido Agung Village breeders group of Rp.3.637.500/year/farmer the B/C ratio of 1.2. Kalaenaliri Village advantage of Rp.3.886.000/year/farmer the B/C 1.2 and advantages Wanasari village of Rp.3788.000/year/farmer and nlai B/C ratio of 1.2. Not much different from the results of research Rusdiana *et al*. (2016), the beef cattle business by way of grazing teh lead oil palm and rubber farmers made profits of Rp.3.185.000/year/ farmer B/C ratio of 1.2. Hoddi *et al*. (2011), suggests that, for beef

cattle development efforts need to be calculating costs, especially the cost of feed, labor and other costs, the feed is a core that must be met every day. To offset the cost of feed and the number of animals kept, farmers need to increase their business scale between 5-10 head/farmer, so it will be more effective and efficient. Is economically more profitable farmers, because they are supported by an environment that ensures the availability of livestock forage flat throughout the year. It is appropriate bali cattle breeding business group gained an incentive in the form of intensive productive cows. Given the rescue program to support productive cows very Siwab program in 2017 and beef self-sufficiency program for the next 2026 years in the future.

Irradiation effect on *Sie Balu* Sensory

Effect of irradiation on the sensory test of *sie balu* shown in Table 1. The sensory test on a product that has significance with regard to consumer acceptance of the product. The parameters used to sensory test of *sie balu* include colour, aroma, texture and flavor. Irradiated unchanged *sie balu* sensory after storage for 0, 3 and 6 weeks.

Based on the analysis of variance showed that the irradiation dose significantly ($P<0.05$) affected on colour, aroma, texture and tasteof *sie balu*. The shelf lifeof *sie balu* after irradiation had no effect ($P>0.05$) on colour, aroma, texture and flavor. Furthermore, irradiation dose and storage time had no effect ($P> 0.05$) on colour, aroma, texture and taste of *sie balu*.

Fenema (1985) in Santoso *et al*., (2013) colour is the most important quality attributes. Although a product of high nutritional value, good taste and texture, but if the color is not attractive, it will cause the product is less desirable. Unirradiated *sie balu* was dark brown and the irradiated one primarily at dose of 9 kGy have a brighter colour than *sie balu* with irradiation 5 and 7 kGy.

According to Desrosier (1988), a dry food ingredient in order to compete with the kind of durability that other foodstuffs should have the good taste, smell and appearance comparable with fresh products or products processed in other ways. Testing the organoleptic properties of food is needed in order to determine directly the quality of foodstuffs. Besidethe testing of the physico-chemical properties and microbiological tests, organoleptic properties is a subjective test which can determine the quality of food quickly (Buckle, *et al*. 1987).

Irradiation effects on physical characteristics of *sie balu*

pH measurement is performed to determine the tendency of increase or decrease in pH during storage. The amount of pH associated with the formation of compounds which are alkaline during storage and will affect microbial growth (Hadiwiyoto, 1993).

The pH values obtained from all the samples tested varied between 5.4-5.8 as presented in Table 2. It is in accordance with the opinion of Brewer (2004) that irradiation

Table 1. The average score of *sie balu* sensory test based on the effect of irradiation dose.

Irradiation dose (kGy)	Sensory				Means
	Colour	Aroma	Texture	Taste	
0	2.5 ± 0.19	3.0 ± 0.3	2.5 ± 0.35	2.6 ± 0.1	2.7 ± 0.24
5	3.1 ± 0.14	3.4 ± 0.1	3.3± 0.21	3.3 ± 0.06	3.3 ± 0.13
7	3.6 ± 0.13	3.7 ± 0.1	3.9 ± 0.15	3.6 ± 0.21	3.7 ± 0.14
9	4.2 ± 0.08	4.2 ± 0.1	4.4 ± 0.17	4.2 ± 0.1	4.3 ± 0.10
Means	3.4 ± 0.72	3.6 ± 0.51	3.5 ± 0.82	3.4 ± 0.67	

only result in a very small change in the pH of the meat.

Table 2. Average values of pH sie balu based on the effect of irradiation dose and storage time

Irradiation Dose (kGy)	Shelf life (week)			Means
	0	3	6	
0	5.7 ± 0.01^{Aa}	5.7 ± 0.01^{Ba}	5.7 ± 0.03^{Ba}	5.7 ± 0
5	5.5 ± 0.02^{Aa}	5.8 ± 0.01^{Ba}	5.8 ± 0.03^{Ba}	5.7 ± 0.17
7	5.6 ± 0.01^{Ab}	5.6 ± 0.01^{Bb}	5.7 ± 0.03^{Bb}	5.6 ± 0.06
9	5.4 ± 0.02^{Ac}	5.5 ± 0.04^{Bc}	5.6 ± 0.01^{Bc}	5.5 ± 0.1
Means	5.6 ± 0.13	5.7 ± 0.13	5.7 ± 0.08	

Note: The big different superscript letters in the same row indicate significant differences (P<0.05). Little different superscript in the same column indicate significant differences (P<0.05).

Based on the analysis of variance showed that the irradiation dose, duration of storage and interaction significantly (P <0.05) affected pH of *sie balu*. According to Forrest *et al*., (1975) the normal conditions of the meat has a pH value ranging from 5,3-5,7 (ultimate pH) which is an interval of pH environment could inhibit the growth of bacteria.

The pH value of *sie balu* that stored up to 6 weeks showed no difference in all treatments. The tendency of the pH value on the stability of the irradiated *sie balu* occur because of bacteria and enzyme activity is inhibited by irradiation. These results are consistent with research Yulianita, (2007), which shows a decrease in the pH value on the meat irradiated with 7 kGy dose after 7 daysof storage time.

Table 3. Average aW values of *sie balu* based on the effect of irradiation dose and storage time

Irradiation Dose (kGy)	Shelf life (week)			Means
	0	3	6	
0	0.8 ± 0.00^{Aa}	0.7 ± 0.00^{Ca}	0.7 ± 0.00^{Ba}	0.7 ± 0.04
5	0.8 ± 0.00^{Ac}	0.7 ± 0.00^{Cc}	0.6 ± 0.00^{Bc}	0.7 ± 0.07
7	0.8 ± 0.00^{Ab}	0.7 ± 0.00^{Cb}	0.7 ± 0.00^{Bb}	0.7 ± 0.06
9	0.7 ± 0.00^{Ad}	0.6 ± 0.00^{Cd}	0.7 ± 0.00^{Bd}	0.6 ± 0.06
Means	0.7 ± 0.03	0.6 ± 0.04	0.7 ± 0.03	

Note: The big different superscript letters in the same row indicate significant differences (P<0.05). Little different superscript in the same column indicate significant differences (P<0.05).

Based on the analysis of variance showed that the irradiation dose, shelf life and interaction significant (P <0.05) affected the AW of *sie balu*.Water activities (abbreviation: AW) is a number that calculate the intensity of the water in the elements instead of water or solid objects. Foodstuffs which has around aw 0.70 is considered good enough and hold it for storage. Various microorganisms have a minimum Aw order to grow well, for example for bacteria has a value of Aw = 0.90; for yeasts and molds aw = 0.80 to 0.90 aw = .60 to .70 (Nilatany et al., 2014).

Effect of irradiation on the count of bacteria in*sie balu*

Effect of irradiation on the count of bacteria in irradiated*sie balu* and unirradiated one listed in Table 4. Irradiation can reduce bacteria in *sie balu*. The count of bacteria in *sie balu* also influenced by vacuum packaging because it can inhibit the growth of aerobic bacteria. *Sie balu* conditions with very low aW also affect the growth of bacteria. According to EFSA (2011) the effectiveness of irradiation affected by the condition and composition of food, the temperature and the amount of initial contamination.

Table 4. Average ount of bacteria (TPC in log cfu/g) in*sie balu* based on the effect of irradiation dose and storage time

Irradiation Dose (kGy)	Shelf life (week)			Means
	0	3	6	
0	4.70 ± 2.38^{Aa}	4.90 ±	2.00 ± 0.21^{Ba}	3.87 ± 1.62

		0.31^{Aa}		
5	1.79 ± 0.25^{Ab}	2.20 ± 0.40^{Ab}	1.52 ± 0.28^{Bb}	1.84 ± 0.34
7	2.28 ± 0.95^{Ab}	1.56 ± 0.33^{Ab}	1.27 ± 0.32^{Bb}	1.70 ± 0.52
9	2.47 ± 0.96^{Ab}	0.00 ± 0^{Ab}	0.00 ± 0^{Bb}	0.82 ± 1.43
Means	2.81 ± 1.29	2.17 ± 2.04	1.20 ± 0.85	

Note: The big different superscript letters in the same row indicate significant differences (P<0.05). Little different superscript in the same column indicate significant differences (P<0.05).

Based on the analysis of variance showed irradiation dose and storage time significantly (P<0.05) affected the count of bacteria in *sie balu*. Furthermore, the interaction of irradiation dose and shelf life had no effect (P> 0.05) to the count of bacteria in*sie balu*.

The count of bacteria in irradiated*sie balu* decreased significantly (P <0.05) in the storage 0 to 6 weeks. These results are consistent with research Yazdi and Jouki (2012) which states that the count of bacteria decreased at doses of 0 to 1 and 3 kGy for a period of 0 to 21 days. Based on research Aly, *et al*. (2012) the higher the irradiation dose the greater reduction in the count of microbes without reducing the sensory and chemical properties of food.

Fardiaz (2006) stated that irradiation of food will cause a number of chemical bonds in DNA disconnected so the cells can no longer replicate. Thus, small changes in the DNA of bacteria will kill the cells. International Consultative Group on Food Irradiation (ICGFI) in 2000 resulted in an opinion that of all the post-harvest handling to reduce microbial pathogens that irradiation is considered the most comprehensive with more than 40 years of worldwide research on the benefits and food security of this technology for the improvement of the quality of food safety. The main purpose of food with irradiation treatment is to reduce or eliminate microbial spoilage and pathogens that may be present in food without causing sensory changes in the product.

CONCLUSIONS

Beef cattle breeders in the district of East Luwu Regency Mangku Tano South Kalimantan Province, the location of agro-ecosystem research has fairly good for the development of cattle Bali. In the economic benefits that could improve the welfare of farmers groups seen from the economic assumptions of each farmer is almost the same. Advantages Sido Agung Village breeders group made profits of Rp.4.537.500/year/farmer the B / C ratio of 1.2, Kalaenaliri village of Rp.5.686.000/year/farmer the B/C 1.2 and Village of Wanasari Rp.5.388.000/farmer/year and value B/C ratio of 1.2. Location forage very research support to the development of beef cattle Bali. But farmers are accustomed way of raising beef cattle between 2-4 head / breeder, so it needs additional maintenance business scale between 5-10 cattle / livestock farmers, so that the business more effectively and efficiently and economically will benefit farmers.

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