

# The Feed Bank: Farmer-Group Based Solution for Subsistence Beef-Cattle Farming In East Java Indonesia

<sup>1\*</sup>Yudi Rustandi, <sup>1</sup>Ach.Syamsuddin and <sup>2</sup>Aisy Karima Dewi,  
<sup>1</sup>Lecturer Programme, <sup>2</sup>Alumni,  
<sup>1,2</sup>Animal Husbandry Extension, STPP Malang, Indonesia

**Abstract**—Feed Bank was the beef-cattle feed production unit that established by farmer group. Feed Bank was the solution of problem in accessing nutritious feed for beef-cattle in subsistence farmer. Beef-cattle farmer in Indonesia doesn't have access to nutritious feed for beef-cattle because lacks of capital, tool and machine for processing beef-cattle feed, and labor. Through farmer group, farmer could unite the existing capital and collectively providing beef-cattle feed from local resource efficiently and sustainably. The concept of Feed Bank could be applied as intensification program for subsistence beef-cattle farming. So that, productivity of beef-cattle farming could be enhanced and thus, providing market's need for beef-cattle's meat. This research aimed to know the implementation of Feed Bank concept in subsistence beef-cattle farming. This research was held to group farmer which has been implementing Feed Bank concept. The result showed that Feed Bank was able to provide beef-cattle feed effectively, efficiently and sustainably. In the end, the Feed Bank also changing the farming system from subsistence farming into the agribusiness-based farming.

**Keywords**—Feed Bank, Beef-Cattle Farming, Feed, Farmer Group, Subsistence Farming

## I. INTRODUCTION

East Java is the province with the largest beef cattle population in Indonesia reaching 30 percent (Priyanto, A., at al. 2012). The beef-cattle farming system in Indonesia, especially in East Java is subsistence (Setianto, N.A., 2014). The pattern of maintenance in subsistence beef-cattle farming system is characterized by the absence of production target that need to be fulfilled, the feeding used natural resource to make it costless if possible (Kaasschieter, G.A., at al., 1992). The subsistence beef-cattle farming also characterized by utilization of the beef-cattle as saving and farmer only sells the beef-cattle when the money is needed (Hastang, and Asnawi, A., 2014).

The subsistence beef-cattle farming system leads to slow increase of beef-cattle population, slow increase in body weight of beef-cattle, and the market need of beef-cattle is unmet (AgusA.,andWidi T.S.M., 2018). In the national scope, this condition leads to the import of beef-cattle to fulfill the needs of society.

In 2016, the Ministry of Agriculture Republik Indonesia launched the program named UPSUS SIWAB to increase the population of beef-cattle in Indonesia. The main focus of this program was to improve the reproductive management of beef-cattle farming in Indonesia. The reproductive management includes: a) examination of reproductive status and reproductive disorder of beef-cattle, b) Artificial Insemination (AI) service and natural mating, c) the fulfillment of frozen semen and liquid N<sub>2</sub>, d) control of productive female cattle, e) fulfillment of fodder and concentrates (Permentan RI No

48/Permentan/PK/210/10/2016 about The Special Effort to Increase Cattle And Buffalo Population).

UPSUS SIWAB. In fact, without proper feed management, calves from UPSUS SIWAB were put at risk of nutritional and reproductive problem. This condition could be happened because the subsistence farmer who kept it would use the calves as saving. Therefore, the goal of UPSUS SIWAB which to increase the population of cattle and fulfill the market needs wouldn't accomplished.

From this explanation, the conclusion is the main problem of beef cattle farming in Indonesia is its subsistence farming system. Without improving the farming system, the effort of UPSUS SIWAB would not succeed in the long run. The subsistence farming system could be improved by giving farmer an access to nutritious feed for beef-cattle (Steinfeld H. and Mack S.). Meanwhile, the existing government program hasn't been put its focus to feed as important component in solving the beef-cattle farming problem in Indonesia.

Generally, cattle farmer lived in the agriculture areas. Thus, the beef-cattle feed that is often used is agricultural waste. The limitation of agriculture waste as feed for beef-cattle was its low nutrient content and digestibility. Low nutrient content and digestibility of agricultural waste could be improved through the feed processing (silage, complete feed, etc). However the processing of agricultural waste could not be applied in subsistence beef-cattle farming. The subsistence farmer of beef-cattle own <5 beef cattle in average. According Mulijanti, et. al., 2016, the beef-cattle farming with average cattle ownership 2-5 has not been able to process feed on its own. Because the feed processing requires tools such as chopper, hammer mill and feed storage, which are not owned by small farmers.

Access of subsistence beef-cattle farmer to nutritious feed could be held through Feed Bank. Feed Bank is unit of feed processing from agricultural waste that based on farmer group. Feed Bank is established and managed by farmer group, the product also used by the member of farmer group. Farmer group is the basis for making feed because it solves the problem of infrastructure problem. The farmer in group could gather the capital to build Feed Bank collectively. Apart from that, the enlightenment program of Indonesian farmer mostly has been based on farmer group.

Based on observations, there are currently several farmer groups that have implemented the concept of Feed Bank. Few of them are UD Brenggolo and Youth Farmers. This research meant to determine the implementation of Feed Bank concept in those 2 farmer groups, to then find out the prospect of Feed Bank as solution of beef-cattle farming problem in Indonesia.

## II. METHOD

The method used in this research is qualitative method. Qualitative research seeks to produce a picture (Sugiono, 2008) and as a developing dynamic (Patton M.Q., 2009) regarding the development of a Feed Bank model in cattle groups in East Java.

The study was conducted in three locations, namely: 1) UD Brenggolo Ngunut Subdistrict, Tulung Agung District, 2) Livestock Farmers Group in Purwosari District, Pasuruan Regency, and 3) SPR AndiniMulyoPapar Kediri Sub-District.

The sampling technique is the selection of informants used in this study is purposive sampling and snowball sampling (Sugiyono, 2008). The informants determined in the study were divided into three groups / triangulation (Bogdan R. and Taylor S.J., 1992) namely; Chairperson, Farmers using complete fermented feed, and Extension as consultants. The data collection techniques (Sutopo H.B., 2001); through in-depth interviews (in-depth interviews), direct observation, documentation and FGD (Focus Group Discussion). While the data analysis technique is an interactive model analysis (Miles, et al., 1992), the data obtained are then presented descriptively with a chart model as a support.

### III. RESULTS

#### Description of UD Brenggolo

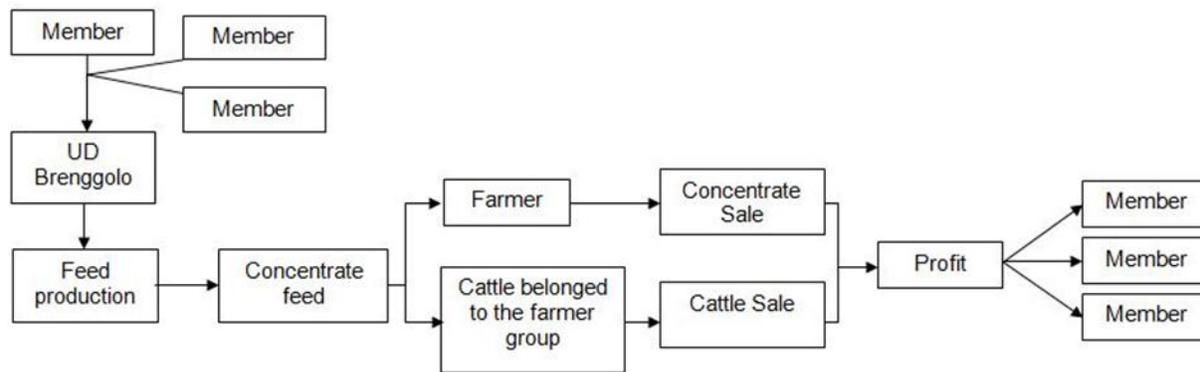


Figure 1. Operational Scheme of Feed Bank in UD Brenggolo

The implementation of Feed Bank at UD Brenggolo started from capital contribution that later become the group in the cash payment. The group cash was used to finance the production of concentrate feed. The concentrate feed is then used as: a) feed for beef cattle belonged to the group member, b) feed of beef-cattle in colony cages that belong to the group, c) sold to farmer in local and other areas in East Java. Profit from feed sale then become the group cash. Every year, the group member get a share of profit from their investment in Feed Bank.

#### The Advantages of Feed Bank Implementation in UD Brenggolo

When this research was conducted, UD Brenggolo has applied the concept of Feed Bank for approximately 8 years. According to UD Brenggolo, the advantage of Feed Bank are:

- Shifts of subsistence farming system towards the farming that based on agribusiness in UD Brenggolo. Concentrate feed made by UD Brenggolo able to increase the body weight of beef-cattle significantly. Within 4 months, beef-cattle was successfully fattened and ready for sale.
- The local farmer community has access to feed for beef-cattle fattening at affordable prices. That way, the maintenance system of beef-cattle business in the environment around UD Brenggolo also shifted towards agribusiness.

UD Brenggolo originated from UP-FMA (Management Unit-Farmer Managed Extension Activities), which is a farmer empowerment program organized by the World Bank through the Ministry of Agriculture in 2010. UD Brenggolo was located in Ngunut District, Tulungagung Regency.

UD Brenggolo member were 1 extension agent from Ngunut District and 8 farmers. The Feed Bank concept was implemented because farmers have difficulty accessing nutritious beef-cattle feed in Ngunut District. The initial capital to build Feed Bank was buildings as a place to produce and store feed, scales, diesel engines, milling machines, and capital of IDR.4.500.000 that collected from all members.

UD Brenggolo produce concentrate feed from 21 kinds of agricultural waste that are protein sources. The agricultural wastes were obtained from various regions in East Java. Concentrate which contained 15,82% crude protein was sold at IDR.2.500. Concentrate feed was sold to the local beef-cattle farmer. The concentrate also has been used by the member of UD Brenggolo and fed to the beef-cattle in the colony cages belonged to the UD Brenggolo.

Operational Scheme of Feed Bank in UD Brenggolo such as Figure 1 below

- The Feed Bank indirectly turned the cattle farming as the main source of income for UD Brenggolo members.

#### Youth Farmers in Pasuruan District

The Description of Feed Bank Implementation in Youth Farmers

Youth Farmers consists of 5 young farmer from Cendono Village, Purwosari District, Pasuruan Regency. Youth Farmers farm maintains beef cattle in colony cages.

The Feed Bank concept has been implemented since the establishment of farmer group in October 2017. The kind of feed that has been made is silage (which made from canon corn and barn) and concentrate (made from cassava peel). The initial capital owned by Youth Farmers to implement Feed Bank was chopper machine, feed grinder, plastic bags to store the silage, and social capital which are trust, reciprocity and social interaction (Fukuyama, 2002).

Youth Farmers received guidance from several academic such as Airlangga University Surabaya, STPP Malang, etc. Youth Farmers then inspired to apply the silage and concentrate technology into their beef-cattle farming through Feed Bank.

Besides feed, Youth Farmers also utilizes the by-products of cattle farming, such as feces that processed into bokashi and urine processed into organic fertilizer. Youth Farmers also produce Local Microorganism that then given to

the beef-cattle, so that the beef-cattle farming does not cause the odor pollution. Operational Scheme of Feed Bank in Youth Farmer described into Figure 2 below.

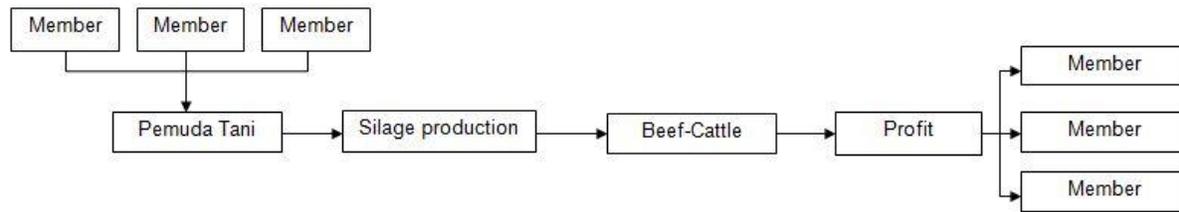


Figure 2. Operational Scheme of Feed Bank in Youth Farmers

Initially, members made capital contribution. The contribution fund become the group cash and then used for operation of Feed Bank. Feed production was done alternately or collectively by group member. If there are members who don't fulfill their obligations, they will be fined. The fine then become a group cash. For now, Youth Farmers produce feed to fulfill the needs of group members only.

### The Advantage of Feed Bank Implementation in Youth Farmers

When this research conducted, Youth Farmers has implemented the Feed Bank concept for approximately 4 months. According to Youth Farmers, the advantage of Feed Bank Implementation were:

- Farmer could provide nutritious feed the cattle efficiently using local agricultural waste
- The existence of Feed Bank makes farmer no longer need to graze, hence provide more time for farmer to do another activity.

## DISCUSSION

### Description Of Bank Pakan

In general, the existence of a Feed Bank at the farmer group level provides several benefits, namely 1) Providing nutritious beef-cattle feed for members of farmer group and the farmer community at general, and 2) Shifting the subsistence beef-cattle farming into agribusiness based farming.

Benefit 1 can be obtained when farmer group able to access agricultural waste continuously, feed technology, facilities and infrastructure to produce adequate feed, and labor for the operation of the Feed Bank. In this first point, the parties that play an important role in implementing the Feed Bank are:

- Farmer group. The interest and hard work of farmer group is the main capital in the implementation of the Feed Bank.
- Livestock extension agents and field-farm staff. Livestock extension agents have an important position in the technology diffusion process, monitoring and evaluation.
- Livestock academics. In the implementation of the Feed Bank in farmer groups, it can be seen that academics collaborate with livestock extension agents to disseminate the result of livestock research that advantageous to beef-cattle farmer.

- Government. The government plays a role in supporting the development of livestock groups through policies and regulations. An example of the policy implemented by the government to support livestock groups is the provision of machine to process the agricultural waste into feed for beef-cattle.

For the sake of sustainability, the implementation of Bank Pakan also requires the application of good management and accounting. Because in the Feed Bank there is a capital turnover so that its use must be planned, controlled and monitored.

Once the Feed Bank is settled there will be a significant change on how farmer treat their beef-cattle. At that moment, the second benefit slowly accomplished. The second benefit can be realized because nutritious beef-cattle produce good calf growth (mature reproductive organs in proper time, no reproductive disorders) and effective body weight gain in fattening beef-cattle. That way, the beef-cattle production cycle can run smoothly, beef-cattle that mee the standards can also be sold directly to fulfill the need of society.

### Flow of the Opportional Model Bank Pakan Center for People's Livestock (SPR) AndiniMulyoKecPapar, Kediri Regency

Feed Bank in the Center for People's Livestock (SPR) AndiniMulyoKecPapar, Kediri Regency is a unit of making complete fermented feed for beef cattle carried out by livestock groups incorporated in the SPR AndiniMulyo. To run the Feed Bank, SPR AndiniMulyo formed a production unit. This production unit is designed as a business unit that produces complete fermented feed of beef cattle made from local feed ingredients. The production in the form of complete fermented feed is intended for SPR members AndiniMulyo to meet the needs of feed concentrates which so far are still dependent on other parties outside the SPR AndiniMulyo. In addition, if the production exceeds the needs of members, it can be sold to farmers in the neighborhood around Papar District.

The complete production unit of fermented feed production of SPR Andinibeef cattle in carrying out daily operational activities uses the Feed Bank Operational Management Model as shown in the following Figure 3:

SPR member AndiniMulyo deposits local feed ingredients that will be used as complete feed fermentation to the Feed Bank.

The feed ingredients are then weighed and processed by workers in the Production Unit using fermentation technology. The fermentation process is carried out on the barrel that is already available. After complete feed production, the feed is distributed to: 1) SPR member breeders, 2) SPR colony cages, and 3) farmers in Papar District. Feed sales to breeders other than SPR

members are possible if food produced exceeds the feed requirements of SPR members and livestock in the colony enclosure of SPR member AndiniMulyo. The costs required to produce the complete fermented feed as well as the price of feed to be paid by feed users are managed by the Group Cash.

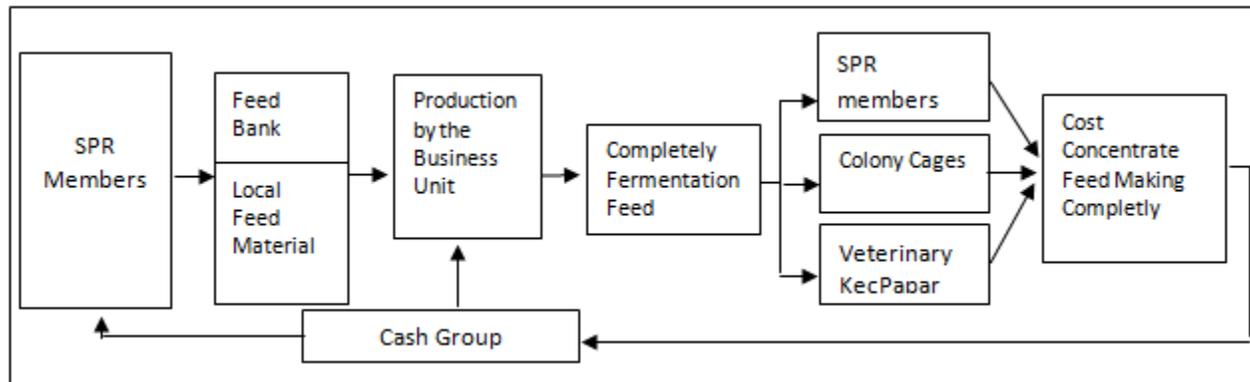


Figure3.Operational Management Model of SPR Feed Bank AndiniMulyoKecPapar, Kediri Regency.

The labor force used in Bank Pakan is a farmer with a weekly picket system. Each member spends half a day working a week. Making food in a day amounts to 3-4 people. Because beef cattle in the colony cages are also given complete feed fermentation, ideally the livestock group also employs outside workers. Revenues from sales of feed and beef cattle will later go to the group's cash to pay farmers who work at the Feed Bank. All activities at the Feed Bank must be recorded so that Bank Feed activities can be evaluated. SPR member AndiniMulyo will get the profit sharing or profits derived from the activities of the complete production business unit of Fermentation Feed Bank after calculating the overall cost and income, namely from: 1) the local feed ingredients deposited, and 2) the benefits of complete fermented feed production.

### CONCLUSION

Study in several farmer-group showed the result that Feed Bank is prospective concept to solve the production problem in subsistence beef-cattle farming. To implement the Feed Bank concept, several capital is needed, such as money, facilities and infrastructure, natural resource, technology, human resource, and social capital.

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