

PPPUD on Zero Waste Balinese Cattle Raising in Tunas jati Farmer Group, Getasan Village, Petang District, Badung

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ABSTRACT

The Regional Superior Product Development Program activities will be carried out at the Tunas Jati Livestock Farmer Group located in Banjar Kauh Getasan Village, Petang District, Badung Regency. This livestock farmer group is engaged in the business of raising Balinese cattle and has been in existence since 2018. The number of livestock owned in this group is 30 heads, with a total of 8 members. In Bali cattle farming, feed will always play an important role in producing good livestock productivity. The problem partners face is their lack of knowledge about quality feed and their lack of ownership of superior greenery that can encourage better livestock productivity. The solutions provided to partners are 1) the introduction or planting of superior forage fodder, 2) Making various applications of technology that can improve and preserve forage feed, and 3) Processing livestock waste into high-value products. The output target to be achieved is TTG Technology for processing and preserving forage feed.

INTRODUCTION

Getasan Village is a village located in the Petang District. The total area of Getasan Village is 310.04 Ha. Utilization of the Getasan Village area includes 27.50 Ha of settlement, 111.46 Ha of rice fields, 104.63 Ha of plantation/fields, 0.66 Ha of the cemetery, 64.7 Ha of the yard, 0.19 Ha of office, and 0.90 Ha of public infrastructure. In 2016, the population of Getasan Village consisted of 1,045 males and 1,055 females with a sex ratio of 99. Population growth was 16.62% from the 2010 BPS census. The boundaries of Getasan Village are as follows: North with Pangsari Village, East with Ayung River, South with Carangsari Village, and West with Peraan Kangin Village (Anon,2005).

Tunas Jati Farmer Group is a livestock group that raises Balinese cattle. The main livelihood of the group members is farming. As with farmers in general, the Tunas Jati farmer group only relies on grass that grows on rice fields, grass that grows wild on vacant land, and agricultural waste as feed for their livestock. The availability of this forage is highly dependent on the season and is also of low quality, so it will automatically affect the growth of the cattle.

Beef cattle require feed in the form of forage. Superior forage will provide good results on the growth and productivity of cattle. Basically, ruminant livestock, one of which is a cow, requires feed as much as 10% of its body weight every day. The feed consists of 60% grass (graminae) and 40% legume (leguminosae). Types of grass include field grass, hay, elephant grass, king grass, odot grass, Zanzibar grass. While the types of legumes are gamal, indigofera, turi, calliandra and the like. Bali cattle can also eat leaves such as hibiscus leaves, jackfruit leaves, banana leaves, and even banana stems. Apart from forage, cows also need concentrate and drinking water according to their needs.

Knowing the amount of cattle feed needed, livestock farmers really need to be able to fulfill their basic living needs and the need for production. Even though sometimes in practice the estimates can go up and down, but the hope is not to stray far from the predictions that have been planned so that there are no losses. How to calculate the need for cattle feed based on the nutritional needs needed by cows. Broadly speaking, the feed requirement for cattle is 3% of body weight obtained from dry and forage feed sources. If we raise around 10 cows weighing 400 kg, the feed or grass requirement per cow is 10% of the cow's body weight or $10\% \times 400 \text{ kg} = 40 \text{ kg}$. Grass requirement for 10 cows = $40 \text{ kg} \times 10 \text{ cows} = 400 \text{ kg}$.

This forage must be fulfilled every day so that the performance of the cattle's feed needs can be fulfilled, if the feed requirement is less than that then the body weight gain can decrease not according to the target.

A livestock farmer knows that the amount of feed needed for his livestock has enormous benefits, including:

1. Save maintenance costs due to wastage of feed
2. Can estimate production costs
3. Efficient time in feeding
4. The basic needs of livestock and for production are met
5. To determine the availability of feed

After knowing the amount of forage or grass needed, the breeder must consider the availability of field grass or forage in the location of the stables or specially planted Forage Forage (Forage) land, so that the forage is available continuously and doesn't run out. If this condition is not as expected, the condition of the livestock will not be optimal so that it will affect the selling price of cattle. Forage feed is the main feed for ruminants (cattle), the need for forage feed for a cow every day is 10% of the cow's body weight. Currently, farmers do not know the exact amount of forage that must be given to their livestock, so whether the amount given to them is sufficient or not. So far, the provision is only based on estimates and habits. The growth and weight gain of cattle in the Tunas Jati farmer group are not maximized. This livestock group requires the introduction of technology and additional knowledge in the field of feed, especially knowledge of the types of forage that are superior in quantity and quality, how to cultivate them, and strategies for feeding them to cattle.

Forage is the main feed for cattle. Its availability is highly dependent on the fertility of the soil where it is cultivated and also the season. In farmers, green fodder can be in the form of grasses, legumes, tree crops, and also agricultural waste that can be utilized as animal feed (Suherman dan Herdiawan, 2021). Nowadays, many superior feed crops have been developed, which in addition to high productivity, also have high nutritional value. Feed crops are classified as sources of crude fiber, energy sources, and protein sources. Grasses are classified as sources of fiber and energy (family Graminae). Those classified as protein sources are legumes (family Leguminosa). In the ruminant feed component, forage always gets the largest portion, which is 60-100%. Some forage species such as Indigofera, dwarf elephant grass, and patching grass are high in nutrients, easy to cultivate, and have high biomass (Rachmawati, 2021)

Mini elephant grass (*Pennisetum purpureum* cv. Mott) is a type of superior grass that has high productivity and nutrient content and has high palatability for ruminants. This plant is one type of quality forage that is favored by livestock. This grass can live in various places, is resistant to protection, responds to fertilization, and requires a high level of soil fertility. Mini elephant grass grows in clumps with compact fibrous roots and continues to produce saplings when pruned regularly. The morphology of mini elephant grass is lush and can reach a height of more than 1 meter so that it can act as a wind break for the main plant. (Marrifatun, 2019). Elephant grass is resistant to relatively long dry seasons. This grass can also grow and adapt to a variety of soils although the results will be different. In cutting the elephant grass stem, it should be left \pm 10 cm from the ground surface. Cutting plant stems that are too short causes slower regrowth, but if the stems are left too long, only the stem buds will develop while the number of tillers will decrease. To get high yields and resilience, this grass is planted with regular irrigation and adequate fertilization (Manauw, 2005).

Indigofera (*Indigofera* sp) is a tree legume. Indigofera or tarum, indigo, or indigo is a plant that produces natural blue color, has high productivity, dense leafy with good nutrient content, especially its high protein content. The nutritional value of Indigofera leaf meal is 27.97% crude protein (containing amino acids that correlate well in the rumen), crude fiber 15.25%, Ca 0.22% and P 0.18%, containing xanthophyll and carotenoid pigments. Indigofera is highly favored by ruminants and can be propagated by seed. The characteristics of Indigofera plants are that the height of the plant ranges from 3 - 4.5 m, has compound and odd leaves, when viewed more carefully resembles a bush and the seeds are pod-shaped. Harvesting of plants can be done optimum cutting at 0.75 -1.5 m from the ground. The cutting interval is 60-70 days depending on the denseness of the plant (Yon, 2010).

Pakchong grass is a superior type of grass that was first planted by Prof. Dr. Krailas in the Pak Chong area, Thailand. Has a long lifespan that can reach 9 years, and can be harvested every 40-50 days. Drought-resistant and thornless. The nutritional content of Pakchong grass is higher than Odot grass, especially the protein content which is 16.45% while Odot grass has a protein content of 13%. Pakchong grass production capacity is 1500 tons/ha/year (Sarian, 2021). The introduction of this superior grass will certainly be able to improve the quality of forage so that it will affect the weight gain and growth of livestock. This group hopes to recognize the technology and have knowledge of forage diversity, have skills in the provision and strategy of forage feeding through counseling, donation of forage seeds, demonstration of cultivation methods, and direct application to livestock.

IMPLEMENTATION AND METHODS

The method of implementing the planned Tunas Jati Farmer Group PPPUD activities is using:

1. Interview and discussion methods to be able to find out the problems experienced by partners.
2. Face-to-face method and providing training, so that partners gain knowledge about the ability to cultivate superior fodder forage and its feeding system for livestock, making fermented feed and making organic fertilizer.
3. Direct practice, guided by instructors who are competent in their fields so that partners can apply the technology provided and can handle problems in handling product processing and business management.

A. Activity Plan and Procedure

PPPUD Activity Plan and Procedures to be implemented are :

1. Survey the location for the implementation of extension activities and the processing process.
2. Interviews and Q&A about the problems faced by partners, as well as planning activities that show steps to solve the problems faced.
3. Partners will be given material that has been prepared by the team in the form of a banana flour product module, given counseling and modules on the cultivation of superior forage, making fermented feed, processing agricultural waste into animal feed, and making organic fertilizer and business management.
4. Delivery of equipment and repair of business premises to partners to support processing and preservation as well as the manufacture of organic fertilizers in supporting the maintenance of zero-waste Balinese cattle.
5. Sustainability in this activity is by carrying out monitoring and evaluation which will be carried out every month after the activity and at the time of the first harvest of grass or forage. In the second year of activities, monitoring will be carried out when opening or seeing the results of fermentation activities and or silage made. Likewise, in the third year, monitoring and evaluation will be carried out at every stage of making organic fertilizer up to the packing and marketing of the product.



Figure.1 Overview of animal feed ini Tunas Jani Farmer Groups

B. Partner Participation

Partner participation in this activity is to provide materials that will be used in PKM activities, as well as provide a place for the implementation of this activity. In this activity :

- Partners are expected to comply with all agreements that have been made
- Partners are expected to be disciplined and earnestly carry out all series of activities until all activity plans are completed.
- After the PPPUD activity ends, partners can continue the business properly and the business that was initiated can grow.

RESULTS AND DISCUSSION

Implementation Activities

Community service activities began with those carried out on , April 15, until Juli 2023. Activities carried out include:

- Providing additional knowledge and assistance of Superior forage fodder seeds so that farmers recognize and can cultivate them (Rachmawati, 2021: Yon, 2020)
- Provides knowledge on how to feed composition in Bali cattle rearing (Sarian , 2013)
- Providing appropriate technology in making fermented feed and processing agricultural waste into feed with better nutritional quality (Salvia, dkk.;2022).



Figure.2 Counseling Activities at the Tunas Jati Farmer Group, Getasan Village

This activity was carried out by involving 20 farmers from the Tunas Jati group. The first thing to do is to provide counseling about the importance of nutritional quality for livestock. Livestock will be able to develop and grow well if the nutrition provided also has good nutritional content. Therefore, the farmers were very enthusiastic when they were given superior forage seeds consisting of Indigofera, Kaliandra, Pachong Grass, Sanzibar Grass, Biograss Grass and Odot Grass. It is their great hope that by cultivating superior forage crops, cattle will develop well and will make it easier to find forage. Another thing that made this activity successful was the excellent growth of forage plants. This is because in the months of activity, a lot of rain still falls so that the availability of water for plants is automatically fulfilled.





Figure.3 Growth of forage plants donated during activities.

Benefits of the Study

The group gained knowledge about the technology of fermented feed by utilizing vegetable waste to become good quality chicken feed. Participants' understanding of fermented feed significantly increased. Before the training, only 15% knew about fermented feed. After completing the practices and training, it increased to 79%. In the monitoring and evaluation activity, 70% of participants practiced making fermented feed. It can be said that this training is very useful because the provision of fermented feed can eliminate the smell of chicken manure and also helps increase the weight of native chickens. After all, with fermentation, the quality of the feed can be improved.

Restricting and Supporting Factors

- **Supporting Factors**

The supporting factor in this activity is the enthusiasm and great desire of the breeders to be able to provide quality feed for livestock. Another thing that is highly anticipated is knowledge about how to give and the amount of feed according to the needs of livestock

- **Inhibiting Factors**

The inhibiting factor in this activity is the limited land owned by farmers so that forage can only be planted in paddy fields and sloping land owned by farmers. This of course can not give maximum results.

- **Solutions and Follow Up**

The solution to the partners' problems regarding the knowledge of cultivating superior forage forages has been given during the training and assistance has also been provided with various types of superior forage plants. Of course this will be able to help breeders to meet the nutritional needs of their livestock. In addition, cultivating superior forage feed will make it easier for farmers to provide feed.

- **The next plan**

This training activity will be continued with assistance for livestock groups. This assistance will continue to be carried out starting from planting, maintenance, harvesting and maintenance management.

CONCLUSIONS AND RECOMMENDATIONS

The Tunas jati Farmer Group of Getasan Village, Petang District, Badung has cultivated superior forage and fed it to cattle as the main animal feed. The use of wild grass as animal feed has been reduced. After the implementation team provided counseling partners knowledge of the types of forage increased from 15% to 80%. Improved forage nutrition (protein) from 6.7% to 16.45%.

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