



## Processing Agricultural Waste as complete feed at DZN Farm<sup>6</sup>

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### Abstract

DZN Farm is a sheep farming group located in the village of Senden RT 10/04, Ngawen, Klaten which has potential in the agricultural sector, especially in the livestock sector. There are 10 breeders with a total of 150 sheep, which have been kept since 2020. One of the potential commodities of Senden village is sheep which are kept as additional income. The DZN Farm livestock group was formed with the aim of ensuring that sheep farmers who are members of the livestock group are able to collaborate with each other, and become a dynamic and growing group. Priority problems faced by partners include: 1) Production aspects including: Quality and availability of feed, namely the decreasing availability of natural animal feed in nature and lack of knowledge of utilizing agricultural waste, Utilization of livestock waste, namely the livestock waste produced has not been utilized optimally; 2) Management and Marketing Aspects, namely Marketing is still semi-conventional, livestock marketing is done by word of mouth between communities and via social media Facebook. The solution for implementing the PKM program is 1) increasing the economic income of livestock groups through engineering complete feed and adding value to livestock waste which is processed into fertilizer. 2) entrepreneurship development which can be achieved through digital-based marketing planning via websites, social media and marketplaces. Meanwhile, the PKM Program's output target is to create an environmentally friendly livestock model to improve the economy.

## 1. Introduction

Senden Village is a center for agriculture and livestock, the majority of residents in Senden Village are farmers and livestock breeders. One of them is located in Senden Village, Ngawen District, Klaten Regency. Senden Village has regional potential to develop sheep farming because it has dry land characteristics. The potential for developing sheep farming businesses in dry land agroecosystems has great potential and is profitable for developing sheep farming businesses. Apart from that, this village is also supported by the availability of quite extensive land. The availability of sufficient land will make it easier to obtain food sources and develop sheep farming businesses.

Sheep farmers in Senden Village are members of a group, namely the DZN Farm Livestock Group. Currently, this group focuses on breeding, fattening and buying and selling sheep. This group was founded in December 2020, chaired by Mr. Sulistyo Wibowo with a total of 10 members. Members always work together in managing the livestock business. The population of sheep in the DZN Farm livestock group currently reaches 150, consisting of two types of sheep, namely fat-tailed and fat-tailed sheep (Figure 3). The Gembel type of sheep was developed as a fattening business and the Fat Tailed Sheep was developed as a breeding business. On this farm the average sheep gives birth twice a year with an average of 2 lambs at a time.



Figure 1. Fat-tailed and fat-tailed sheep

The type of cage used at DZN Farm is a cage structure in the form of stilts. The construction of the cage is made on stilts and under the floor of the cage there is a pit. There are 2 main cages, namely; holding cages for breeding and fattening cages with an area of 1.5m x 12m and 2m x 12m respectively.



Figure 2. Grow-out cage and broodstock cage

The main problem faced by the DZN Farm livestock group is a lack of knowledge about feed management. At the beginning of the group's formation, sheep feeding was still done conventionally by providing forage in the form of grass, so it was very dependent on the availability of forage in nature which was limited by the season. The limited number of workers also causes daily livestock feed to be less than optimal, while the role of feed in the livestock business is one of the keys to successful livestock production.

To increase the productivity of their business, group members continue to seek breakthroughs, including providing combination feed, namely forage and concentrate when the supply of forage in nature decreases. Based on the results of field surveys, the existence of this agricultural land is a source of supply of ingredients for fermented feed, most of the composition of which requires forage. The opportunity to make fermented feed at the DZN Farm farm is supported by the condition of local agricultural waste around the DZN Farm farm in the Senden Village area.

Apart from feed, the cleanliness of the environment around the pen is one of the factors that supports the success of sheep production. The DZN Farm sheep farm has not yet processed sheep manure waste effectively. Urine and solid waste are simply left piled under the cage and sometimes sold at low prices to farmers around the DZN Farm farm.

On the other hand, livestock groups have large amounts of capital, namely large amounts of available livestock land which has not been utilized optimally, lack of partner knowledge about business diversification through an integrated livestock concept (livestock-food crops), causing partners to only get income generating from one business source, and causes weak business resilience.

## 2. Methods of Implementation

The parties involved in this community partnership program activity include (1) the service team (2) two students, (3) all members of the partner group, and a workforce of 10 people.

### 1) Methods of Applying Science and Technology

Several approaches taken by the implementation team in order to provide solutions to the problems faced by partners are the Knowledge Transfer, Technology Transfer (TT), Science and Technology Diffusion and Entrepreneurship Capacity Building approaches. There are 3 measurable indicators in the implementation of Technology Product Dissemination to partner groups, namely: Indicators of increasing the quantity of partner facilities and infrastructure which can be achieved through additional production facilities, namely complete feed fermentation processing facilities. Indicators of entrepreneurial development that can be achieved through digital-based marketing planning via websites, social media and marketplaces.

### 2) Work Procedures

The program implementation procedure includes several stages, including:

a) Socialization Stage, at this stage, the implementing team conducts socialization of the community partnership program to partner group members to provide an explanation of the scope of activities, rights and obligations of group members, and post-program governance so that this program can be sustainable.

b) Implementation Phase, this phase will be implemented for 8 months, including:

#### [1] Complete Feed Engineering

- Knowledge transfer through a structured counseling and training stage, at this stage group members are provided with education about the types of feed ingredients that have potential as sheep feed ingredients, skills in making complete feed using forage raw materials and local agricultural waste.

- Technology Transfer through the demo plotting stage of making reinstatement. The formulation of sheep reinstatement is based on the needs of sheep for breeding and fattening purposes. Starting with the collection of feed ingredients from local agricultural waste (rice straw, corn straw, cassava peel, banana tuber, pineapple peel, etc.), industrial waste (bran, tofu dregs, onggok, etc.), and other feed ingredients (yellow corn, elephant grass, Urea, molasses, EM4, starbio etc.), according to the nutritional needs of one year old lambs [8].
  - Evaluation of activities based on: a) increasing breeder knowledge as measured using pre-test and post-test instruments, b) observing parameters for the success of the final replant product which are subjective, including: color, odor, texture and pH, c) Efficiency of replanting sheep production by calculating PBT and ration efficiency (Equations 1 and 2).
- [2] Business diversification through integrated livestock patterns (livestock-food crops)
- Knowledge transfer through structured counseling and training stages regarding integrated livestock concepts and patterns (livestock-food crops).
  - Making demonstration plots for food plants, partners already have food plants, but have not been cared for optimally, making demonstration plots is carried out on plots measuring 100 m<sup>2</sup> with a total of 25 plants which will be treated with POC and compost every 2 weeks
  - Evaluation of activities based on: a) increasing farmer knowledge as measured using pre-test and post-test instruments, b) observing parameters for the success of the final demonstration plot product as seen from food plant growth indicators.
- c) Mentoring Stage, namely providing regular coaching and mentoring so that the science and technology applied can run sustainably.
- 3) Partner Participation in Program Implementation
- To support and make the implementation of this program a success, partners consciously participate by taking part in all counseling and training, including providing a place, local raw materials for fermented animal feed, wooden battens for making solid and liquid manure separator installations. This PKM activity is carried out using a Participatory Action Programs approach where the group members and workers involved apply technology directly to their livestock objects.
- 4) Evaluation of Program Sustainability
- Program evaluation is carried out in stages at the end of each implementation stage as described above. Evaluation is aimed at finding out the output obtained by group members after the treatment given. In the next stage, both internal and external monitoring will be carried out on the entire series of activities from preparation to implementation. Internal monitoring will be carried out once by LPMPP UMS during demonstration plot testing. Meanwhile, external monitoring will be carried out by the DRTPM Reviewer team of the Directorate General of Higher Education, Research and



Technology. as organizer of activity funding, and is carried out once at the end of program implementation.

### 3. Results and Discussion

Implementation of the Community Partnership Empowerment Service Program activities for the application of appropriate technology for processing agricultural waste into complete feed, is described as follows: At this implementation stage the service team will provide socialization or counseling regarding the potential of agricultural waste and other feed ingredients for sheep feed. . This activity is carried out by means of socialization. In this activity, feed ingredients are explained as sources of protein, carbohydrates and fiber from agricultural waste and market waste around Senden village. At the socialization stage, it is also explained in simple terms about the digestion of ruminant livestock so that farmers understand what feed ingredients and agricultural waste are suitable for ruminant livestock, especially sheep. The ability to identify feed ingredients is needed as a basis for breeders to determine appropriate feed.

In the next stage, socialization will be carried out on how to use agricultural waste chopping machines in a practical way. In this activity, it is explained how or how to operate an agricultural waste chopping machine so that the results of chopping agricultural waste get good results.

Furthermore, pilot practical activities were carried out in making fermentation which consisted of feed ration formulations from Pakchong, as well as dry ingredients in the form of corn kernels, dried kangkong, tela cob. Later it will be processed into alternative feed ingredients that match the nutritional content that livestock animals need to accelerate meat growth. The stages can be described in the image below:



Figure 3. Agricultural waste collection process



Figure 4. Enumeration of Agricultural Waste



Figure 5. Mixing agricultural waste with dry materials



Figure 6. Storage process in a barrel



The agricultural waste that has been completed is placed in a barrel, then left and the barrel is tightly closed for a minimum of 10 days for the process of absorbing the water content contained in the pakchong. This water content will be absorbed by the dry raw materials that have been mixed during the process of chopping up the agricultural waste. After 10 days the sensitization process has been completed and can be opened, then the ensilage is taken. If the waste processing process is carried out correctly, alternative feed can last one to two (1-2) years. Meanwhile, the characteristics of good selase are: The taste and smell are sour, the color of the feed is still bright, the texture of agricultural waste is still clear and is not moldy, slimy and lumpy.



Figure 7. Results of the Fermentation Process of Agricultural Waste

Apart from processing silage, Partners are provided with ways to use agricultural waste to make dry feed ingredients as a mixture for making silage. The ingredients used are 1) dried kangkong, 2) ground corn, 3) soy beans, 4) Polar Brand, 5) Rice Bran, 6) Salt, and 7) probiotic solution.



Figure 8. Process of mixing raw materials to make dry feed



Figure 9. Results of making Dry Feed

During the training process for making repakansi, several group members took part immediately helped make the repair, very enthusiastic and showed a sense of desire know very high. The training process went very well due to feedback from a truly optimal group of partners. After the counseling and training stage is complete Once completed, group members fill out a questionnaire to determine the level understanding regarding reparations.

#### 4. Conclusion

The conclusion obtained from the results of community service is that the level of knowledge of livestock groups at DZN Farm has increased, usually livestock are given fresh forage, currently farmers can make dry feed ingredients and silage which can be stored for long periods of time, apart from the economy, Farmers can now get additional income from selling animal manure and silage feed and dry feed.

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- 4) Members of the proposing team who are willing to be bothered to complete community service activities

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