

# Application of Chopper Machinery Technology from Oil Palm Fronds in Huta Gondang Rejo Nagori Bandar Tongah Bandar Hands, Regency of Simalungun

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**Abstract.** This community service activity aims to improve the efficiency of cattle farm business in Huta Gondang Rejo Nagori Bandar Tongah Bandar Hulan Subdistrict Simalungun Regency through the use of pellet complete feed based on palm oil fronds and agricultural waste. This activity is conducted on cattle ranchers who are members of the farming community group Huta Gondang Rejo. Farmers are given counseling and training on the processing of palm oil fronds and agricultural waste into livestock feed and the establishment of a complete ration of palm-based pellet and agricultural waste. To facilitate the transfer of this technology to the breeder, then prepared a complete feed pellet with 5 types of machines :palm crusher counter machines or palm crafter engines with a capacity of 600 kg/hour, pellet printing machine (granulator) with capacity of 100 kg/hour, mixer machine (mixer feed) with a capacity of 50 kg/stir, dryer (oven) with capacity of 10 kg/rack, and manual press feed press tool with specification 2 kg/print. The results of the activities showed that, the performance of palm cropping machine for cattle that get complete pellet feed is better than cattle that get conventional or traditional feed. This chopper machine can count the palm stem from the tip of the base of the leaf to the stem (80% of the palm stem). Through the activities of plant waste feed technology is expected to achieve some outcomes, namely, improve the productivity of farming through the system integration of livestock combine farming system with synergistic system to form an effective, efficient and environmentally friendly.

**Keywords:** Coppher Machine, Agricultural Waste, Animal Feed

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**Abstrak.** Kegiatan pengabdian masyarakat ini bertujuan untuk meningkatkan efisiensi usaha peternakan sapi di Huta Gondang Rejo Nagori Bandar Tongah Kecamatan Bandar Hulan Kabupaten Simalungun melalui penggunaan pakan komplit pellet berbasis pelepah sawit dan limbah pertanian. Kegiatan ini dilakukan pada peternak sapi yang tergabung dalam kelompok masyarakat usahatani Huta Gondang Rejo. Peternak diberi penyuluhan dan pelatihan tentang pengolahan pelepah sawit dan limbah pertanian menjadi pakan ternak dan pembuatan ransum komplit pellet berbasis pelepah sawit dan limbah pertanian. Untuk memudahkan transfer teknologi ini kepada peternak, maka disusun pakan komplit pelet dengan 5 jenis mesin : mesin pencacah pelepah sawit atau mesin perajang pelepah sawit dengan kapasitas 600 kg/jam, mesin cetak pellet (granulator) dengan kapasitas 100 kg/jam, mesin mixer (pengaduk pakan) dengan kapasitas 50 kg/aduk, alat pengering (oven) dengan kapasitas 10 kg/rak, serta alat press manual cetak pakan dengan spesifikasi 2 kg/cetak. Hasil kegiatan menunjukkan performan mesin pencacah pelepah sawit untuk ternak sapi yang mendapat pakan komplit pellet lebih baik dibandingkan dengan ternak sapi yang mendapat pakan konvensional atau tradisional. Mesin Chopper ini dapat mencacah pelepah sawit dari ujung pangkal daun sampai ke batang (80% dari pelepah sawit). Melalui kegiatan teknologi pakan limbah tanaman diharapkan tercapainya beberapa luaran yaitu, meningkatkan produktivitas usahatani melalui system integrasi tanaman ternak memadukan system usahatani dengan sinergis sehingga terbentuk sistem yang efektif, efisien dan ramah lingkungan.

**Kata Kunci:** Mesin Chopper, Limbah Pelepah Sawit, Pakan Ternak

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## 1. Introduction

Serbalawan Village is one of the villages located in Simalungun district, North Sumatra. It is located between 02 ° 36'- 03 ° 18 'north latitude and between 98 ° 35' east longitude at 0 - 1400 meters above sea level [1,2].

With sufficient ground elevation and rainfall, this village is a suitable land for oil palm crops. Hopefully, farmers can utilize oil palm fronds (OPF) as an alternative to livestock feed. In PT Perkebunan Nusantara IV located in the village of Serbelawan, as a routine activity in the plantation generally,  $\pm 2$  OPF is cutted / dumped from every palm tree in the fruit harvest [2]. According to Ginting[3], the production of midrib and palm leaf can reach 61 tons / ha / year. While Fakhri et al. [4], stated that the average OPF production from oil palm plantations is 69 tons/ha/year or 20 tons of dry weight/ha/year and production varies according to the age of oil palm.

Palm oil as the main commodity in the village of Serbelawan resulted in the village surrounded by thousands of hectares of oil palm plantation, where villagers work as employees of oil palm plantations, cattle ranchers and farmers. In this case, especially for cattle ranchers, there is an idea to improve the quality of the way of giving and serving animal feed. Because the village is surrounded by oil palm plantation, part of palm stem that is waste from oil palm plantation can be utilized to be processed into animal feed. Of course before becoming animal feed in accordance with the nutritional needs for livestock, then first in though through several stages.

One technology that is potential to be applied is pelleting technology. Pellet is a mass form of feed material that is compacted by high pressure through a molding hole of a certain size [5]. Pellet is generally elliptical and better known as complete feed (complete feed) because it is composed of various feed ingredients, either fibrous or concentrate feed and contains balanced nutritional levels to meet the nutritional needs of livestock.

As a USU-Built Village Program "Agricultural Agriculture Model on Land Plants In KutaGondangRejo Village Bandar Tongah Bandar Haluan District Simalungun", the application of pelleting technology in the use of OPF as animal feed will facilitate in terms of economics and efficiency of farmers built village in the care livestock.

Problem faced by partners in this case is the limitation or ability in the supply and processing of animal feed derived from palm oil stem waste. Generally partners still use the manual way in the presentation of feed so that the capacity is very limited and in a long time.

The expected objective of community service is that partners are able to provide livestock feed in large amounts of time and capacity not too long, so that time can be utilized for other activities related to livestock care.

## **2. Method**

The counseling and training was conducted in Kuta Gondang Rejo Nagori Bandar Tongah Village, Bandar Huluan Subdistrict, Simalungun Regency and implemented on October 20, 2017. In the extension and training activities to farmers used palm stem and agricultural waste which is processed using a machine for making complete pellet ration as animal feed. The machines used in this counseling include (a) chopper machine, (b) mixer machine; (c) granulator machine; (d) oven machine; (e) manual crank press.

Using existing machine rocks, palm fronds and agricultural waste are chopped and mixed with additional ingredients to meet the nutrients for animal feed.

### 3. Result and Discussion

Processing of palm oil and agricultural waste into livestock feed and making of palm-based pellet commodity rations and agricultural wastes, using machines that can efficiently empower and fund the farmers to feed their animals. The machines used include:

1. Copper machine (Figure 1)

Copper machine is a coconut oil palm cutting machine and agricultural waste with the data contained below:

- a. Capacity: 600 kg hours,
- b. Activator: Diesel 20 Pk 2200 RPM,
- c. Diesel fuel,
- d. UNP Frame: 80 x 80 x 3 mm,
- e. Material knife: Steel hardening > 60 HRC.



**Figure 1.** Chopper Machine

2. Mixer Machine (Figure 2)

Mixer machine is a mixing machine or cattle feed mixer with the data contained below:

- a. Capacity: 50 kg / Stir,
- b. Drivers: Diesel 10 PK 2200 RPM,
- c. Diesel fuel,
- d. UNP Frame: 50 x 50 x 2 mm,
- e. Type: horizontal screw.



**Figure 2. Mixer**

3. Granulator Machine (Figure 3)

The granulator machine is a pellet making machine, this machine has data listed below:

- a. Capacity: 100 kg / hour,
- b. Activator: 8.5 HP gasoline engine,
- c. Fuel: Gasoline,
- d. UNP Frame: 50 x 50 x 2 mm,
- e. Die hole: 8 mm.



**Figure 3. Granulator Machine**

4. Oven (Figure 4)

Oven is a machine that serves as a dryer of the feed that has undergone several processes from the use of the above machine. This machine data is listed below:

- a. Capacity: 10 kg / rack,
- b. Number of shelves: 7 racks,
- c. Burner: Gas Lpg,
- d. Heat distribution: Rack crack,
- e. Iron frame: 30 x 00 x 2 mm,
- f. Wall: Stainless,
- g. Heat sensor: Digital.



**Figure 4.** Oven

#### 5. Manual Press (Figure 5)

This tool works to print feed in solid form, with the data listed below:

- a. Capacity: 2 kg / print,
- b. Mover: Rod Steel,
- c. Dies: Diameter 4 "and Thickness 10 Cm,
- d. Elbow frame: 40 x 40 x 2 mm,
- e. Type: Manual press.



**Figure 5.** Manual Press

Measuring the success of this activity is seen from the level of farmer adoption of pelleting technology and the difference of ration conversion between cattle that get complete feed and conventional or traditional. Performance of palm cropping machine for cattle that get complete pellet feed is better than cattle that get conventional or traditional feed. This chopper machine can count the palm stem from the tip of the base of the leaf to the stem (80% of the palm stem). The outcomes that achieved through this activities were improvement of the farming productivity through the system integration of livestock and farming system, efficient and environmentally friendly of farming system.

#### **4. Conclusion**

The availability of alternative feed ingredients that are lacking in Huta Gondang Rejo Nagori Bandar Tengah, Bandar Hulan Subdistrict requires special attention in the effort to maintain the production of cattle. Understanding of new feedstock processing and feedstock technology especially palm bleach provides new insight to breeders in the utilization of non-conventional feed ingredients. In its implementation, breeders can choose between the combination of material and technology type, material type or technology only. It is expected that over time, positive results will also have an impact on the economy of the built villages.

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