

## STUDY OF UTILIZATION AND MAPPING POTENCY OF PLANTATION BY-PRODUCT TO SUPPORT SHEEP PRODUCTION IN NORTH SUMATERA

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### Abstract

The objectives of this experiment were to make a map of plantation by-product and factory waste and to examine the use for sheep production in North Sumatra. In this research there was 12 heads lamb of Sei Putih Cross Breed and 12 heads lamb of Sumatra Thin Tail. Concentrate contains 14 % crude protein (CP) and 70% total digestible nutrient (TDN). The design used was randomised completely block design with experiment factorial 2 x 4, replicated three times. The result of the experiment showed that potency of plantation by-product and its factory for sheep about 4.7 million heads per year. Dry matter consumption, average daily gain and feed conversion were not significantly effect ( $P>0.05$ ) among treatments.

Key words: Mapping, Plantation by-product, Sheep

### Introduction

Plantation by-product and factory waste can be applied for an alternative feed. Although, it did not used maximize yet (Aritonang, 1986). In this case, oil palm, cocoa, sugar cane produce by-product like palm kernel cake, solid decanter, oil palm leaf and molasses, which can be used for sheep feeding.

Total area of palm oil plantation in Indonesia about 2,633,819 hectare, cocoa 668,919 hectare, and sugar cane 407,502 hectare, respectively (Statistik Perkebunan Indonesia, 1998). According to researcher, total area of oil palm in North Sumatera about 23.93%, cocoa 7.25%, and sugar cane 4.35%, respectively compared with total plantation in Indonesia.

Devendra (1977) reported that palm kernel cake could be given 40% in sheep ration. Ghol (1981) reported that using 40% of solid decanter in sheep rations still shows good effect. Palm oil leaf can be used 20 to 30% in sheep ration (Hasan and Ishida, 1999). Cocoa pod can be used 15 to 30% in sheep ration (Pusat Pengembangan Investasi dan AMDAL, 1998). Molasses can be used 7.5% in sheep ration (Elieser, 1992).

To determine the potency of plantation by-product and factory waste for

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development of sheep production in North Sumatra, it is necessary to map plantation by-product as well as the study its utilization for sheep fattening.

### Materials and Methods

This experiment has two steps:

**Step I.** The objectives of this experiment were to make a map of plantation by-product through survey method in six districts in North Sumatra. Total area of palm oil, cocoa and sugarcane were surveyed, also their by-product potency to find out carrying capacity for sheep production development.

**Step II.** The objectives of this experiment were to analyse the use of plantation by-product and factory waste for sheep production. Concentrate contain 14% crude protein, 6% extract ether, 18.32% crude fibre, 8.29% ash, 0.56% Ca, 0.26% P and 70% TDN. The needs of dry matter were given 4.30 to 5% from body weight (NRC, 1985). Concentrate offered and the residues were determined every day to measure the intake while body weight changed was determined every two weeks. Water was available all day long.

The design used randomised completely block designed with experiment factorial 2 x 4.

Factor I, sheep breed (B)

B1 = Sei Putih Cross breed

B2 = Sumatra Thin Tail Breed

Factor II, concentrate/ basal feed (P)

P1 = Basal concentrate (ration)

P2 = P1 + 3 % chicken feather mill hydrolysed

P3 = P2 + 0.12 % Cl + 0.17 % S

P4 = P3 + (0.40 ppm I + 0.15 ppm Se + 0.15 ppm Co)/kg of concentrate DM.

The experiment has eight combinations treatment, which replicated three times. Parameters that measured were plantation by-product potency, feed consumption, average daily gain and feed conversion.

### Statistical Analyses

Data was tabulated and analysed by analyses of variance (ANOVA) with Duncans Multiple Range Test difference analyses (Yitnosumarto, 1991).

## Results and Discussions

### Carrying Capacity of Plantation By-Product for Sheep Production Development

Carrying capacity of plantation by-product for Sheep was calculated based on DM need about 2.5 – 3.5% body weight (BW). Potency of by-product for sheep was shown on Table 1 below.

Table 1. Potency of plantation by-product and its factory waste for sheep in six districts in North Sumatra (heads per year)

District	Total by-product (tons)	Potency of plantation by -product for sheep (heads/year)
Tapanuli Selatan	197.30960	441.28016
Labuhan Batu	842.92693	1885.17417
Asahan	343.72996	768.74725
Simalungun	264.75428	592.11925
Deli Serdang	219.57589	491.07840
Langkat	302.19365	675.83188
Total	2170.49031	4854.23111

Source: Calculated by Siregar, 2001

Today, sheep population in North Sumatra in six districts about 158,953 heads. Based on such plantation by-product status, North Sumatra can support 4.69 million heads of sheep per year.

### Feed Consumption, Average Daily Gain (ADG) and Feed Conversion Ratio

Initial and final body weight, average daily gain, daily intake concentrate and feed conversion is shown in Table 2 below.

Table 2. Initial and final BW, ADG, daily intake ration and feed conversion ratio

Variable	Block		
	I	II	III
Initial BW (kg)	12.00	14.00	16.00
Final BW (kg)	13.96	15.94	18.00
ADG (g/h/d)	78.50 <sup>a</sup>	79.00 <sup>a</sup>	80.00
Daily Intake Ration (g)	547.16 <sup>a</sup>	527.00 <sup>a</sup>	613.00
Feed Conversion Ratio	7.73 <sup>a</sup>	7.23 <sup>a</sup>	8.89

Dry matter consumption was not significantly shown ( $P>0.05$ ) among blocks either treatments (547.16, 527 and 613.25 respectively). Dry consumption every

block (I= 4.2% BW, II=3.5% BW and III = 3.6% BW). This consumption was too far from which recommended by Nutrient Requirements of Domestic Animals, Nutrient Requirements of Sheep-NRC (1985) i.e. 4.3 – 5% BW. It because of the component of ration is consisting of 100% from plantation by-product, which have low nutrition. Besides, 14% CP and 18.32 CF. It mean that in this experiment, predicted was lack of crude fibre.

Dry matter consumption that reported by Haryanto (1995) about 880 g/head/day. Because of average daily gain not significantly difference show among treatments (78.50, 79 and 80 g/head/day, respectively). The highest average daily gain shown in block III. According to Inounu (1996), to find offered BW (35 kg), average daily gain must be gain 130 g/h/d. Lower feed consumption would have caused lower ADG. There was probe that protein content of ration did not satisfy yet to support higher ADG.

Feed conversion did not show significantly difference (7.73, 7.23 and 8.89, respectively). The best – feed conversion in block II is 7.32. Nevertheless, the lowest in block III is 8.89. Both feed conversion and feed consumption was calculated as well as compared with ADG. Feed conversion average 7.95 lower than 9.29 reported by Wina (1995) and higher than 6.28 according to Haryanto (1995).

### Conclusion

It can be concluded that the plantation by-product can be support 4.69 million heads sheep per year in North Sumatra. The difference of initial body weigh, difference feed conversion. Feed consumption and ADG not significantly among treatments. In this experiment, concentrate consist of 14% CP, 18.32% CF was not enough to increase the ADG.

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