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## INTEGRATION OF PALM FRUIT PLANTATION AND CATTLE; POTENTIAL SYSTEM TO IMPROVE CATTLE PRODUCTION

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### ABSTRACT

*Integration of cattle and palm fruit (SISKA) has known as programme to improve cattle production and population in Indonesia. Palm fruit plantation not only provide area for cattle to wander but also provide feeds as forage and stem-midrib of palm. However, this system seem fails to meet their objections. There are very few of palm fruit plantation in Indonesia applied this system volunterilly. Main reason for that were technical and management problems. This study will explore problems and answer related to application of integration of cattle and palm fruit plantation, and also applied the systems in fattening calf program using palm fruit by products. Twenty steers with average of body weight  $153 + 5,3$  kg were grouped into two groups. Each group consists of 10 BX steers. Control group were given forages while treatment group has feed ratios consists of stem-midrib of palm, CPO sludge and salt. Each ratios were formulated to have same dry matter percentage. They were treated 2 month. Observed parameters were dry matter consumption, dry matter digestibility, average daily gain and body condition score. The results shows that there were no significant results on dry matter digestibility, dry matter consumption ( $P > 0,05$ ). However, treatment group has better average daily gain and body condition score.*

**Keywords ;** integration, cattle, palm fruit

### INTRODUCTION

Increased human population growth and increasing urbanisation, will significantly drive the demand for animal foods. Increasing meat consumption requires bigger ruminant population, hence higher forages requirement to feed them. Remenji and Mc William (1986) suggested the need for doubling of forage supply for the livestock, and one obvious source of naturally occurring forage and of land for improvement of forage supply is the area under plantation crops. The presence of a range of perennial tree crops in many of the countries of South East Asia provides a common platform for development of integrated system involving ruminants. Production system integrated with perennial tree crops like coconut, rubber, oil palm and fruits as well as the use of available agro-industry by-product. The integration of cattle in oil palm is a form of mixed farming where the combinations of the two commodities can be synergized in order to optimally utilize the same piece of land. The two commodities, when properly integrated can contribute towards sustainable food production system (Ayob and Kabul, 2009).

A significant change in the oil palm industry has taken place during the past season, as Indonesia surpassed Malaysia in production of palm oil and is now the world leader (USDA, 2007). In Indonesia, 8.43 million hectares of the oil palm plantation areas are suitable for integration. 20 or 30% of the crude oil is used in the animal production programme, making feasible a radical increase in the number of animals, depending on the volume of processing of the extraction plant. This represents the integration of the agriculture and livestock components, which could lead to a major improvement in the efficiency of use of the available resources. It will result in a larger production of biogas, fertilizer and animal products and reduce the dependence of the system on bought-in

fertilizer. This may be further enhanced by the introduction of green manuring. The system will involve 20-30% of the crop for animal feeding and additional crops which do not compete significantly with the palm (Duran, 1995).

The oil palm industry, with diverse products and by-products, offers two opportunities for the promotion of animal production. Firstly, the products and by-products from the industry are valuable feed resources with the potential to be utilised for expanding animal production. Secondly, the forages in the inter-rows can be consumed by ruminants. Integrating animal production with oil palm plantations should take into account all the available resources, i.e. the products and by-products of the industry as well as the forages grown in the inter-rows (Jalaludin, 1997). This study will exploring implementations of Integration of palmfruit plantation with cattle's feedlotting.

## MATERIAL AND METHOD

Sixteen steers with average of body weight  $153 + 5,3$  kg were grouped into two groups. Each group consists of 8 BX steers. Control group were given forages while treatment group has feed ratios consists of stem-midrib of palm, CPO sludge and salt. Each ratios were formulated to have same dry matter percentage. They were treated 2 month. Observed parameters were dry matter consumption (%), dry matter digestibility (%), average daily gain (kg/day) and body condition score (range of 1-8).

Table 1. below describe the composition of ratios given to each group. Each group were offered ratio 2 times day<sup>-1</sup> with almost same dry matter percentage.

Table 1. Ingridient and nutrient composition of ratio

Ingridient	Control	Treatments
Forages (kg)	20	10
Palm oil Midrib-stem (kg)	-	3
Palm oil sludge (kg)	-	1
salt (g)	-	100
Composition		
Dry Matter (%)	42	41.2
Organic Matter (%)	95.3	92.6
Crude Protein (%)	6.4	5.8
Crude Fat (%)	5.2	11.8
Crude Fibre (%)	12.2	10.8
Ash (%)	4.2	7.1

## RESULT AND DISCUSSION

Data shows that although control group has higher dry matter digestibility (7,91 vs 5,42 kg day<sup>-1</sup>) but the percentage of dry matter consumption is lower. From calculation we could generated ratio's efficiency on treatment is insignificantly difference than ratio's control (0,38 vs 0,39), however the ADG's and BCS of treatment group is higher than control.

Table 2. Average of Parameter's Data

No	Parameters	Control	Treatment
1.	Dry matter digestibility (kg day <sup>-1</sup> )	7,91*	5,42
2.	Dry matter consumption (%)	63,10	66,02*
3.	Average daily gain (kg day <sup>-1</sup> )	0,35	0,51
4.	Body condition score (BCS)	3,4	3,7

Asterix (\*) shows significant result ( $p < 0,05$ )

Consumption of dry matter of treatment's ratio were higher than control, therefor the availability of nutrients also higher than ratio's control this condition is same as Jinping et al. (2010) has in their research. The quantity of ratio's given were higher than the requirement of dry matter for growth, therefor cattle could metabolized the available nutrients for their production. Condition of adlibitium feed with consistent time feeding will give positive result on cattle daily gain (Sangmoo et. al., 2010). In this research the ratios given are formulated to have almost same percentage of dry matter, however the intake for each ratios were different. This has something to do with the palatability of the ratios. Ratio's in treatment group has better palatability than in control group. Although each group were adapted to the ratios but those cannot affect the palatability of ratios. Givens et al., (2000) state that feeds palatability plays major role in dry matter intake of feed itself.

In term of integration, ratio's in treatment control were using palmfruit midrib-stem, it consists almost 30% from ratios. Palmfruit midrib-stem were milled using specific chopper and it turns into rough flour. This condition were helpful for storage and further treatment. Devendra and Leng (2010) explains that usage of agro-industry by products must be followed by treatments as the comodities were subject to antinutrition and expired condition. It also mention that low quality nutrition of agro-industry by product products could be enhance by combined them with conventional feeds or treat them to increase their nutrition value, as in fermentation. This research were aimed not only on it's integration term but also in implementation aspect of this method. Composition of ratio's were arranged to be applied directly without needs of further treatments. This could drive the other palm fruit plantation applied same or enhanced method to feed their cattle as efficiently. One of the problems in application of animal-farm integrated system were the simplicity of the system (Devendra, 2010). The more complex the system the lower of user of that system.

High result in average daily gain and BCS in this research indicates that using of palmfruit midrib-stem and palm oil sludge as feed component were potential to develop. However, nutrient quality of milled palmfruit midrib-stem and palm oil sludge should be put into consideration since time storage would lowering its quality. Jalaludin (1997) stated that there are two intrinsic problems in the utilisation of palm oil sludge, namely, the high oil residue and the copper content. The oil content in certain cases can be as high as 20%, which can cause rancidity and rejection by the animals. The extent of copper toxicity in larger ruminants is somewhat unclear because feeding Palm oil sludge over a long period to either cattle or buffalo has not resulted in retarded growth or mortality.

## CONCLUSION

Integration of palm oil plantation and cattle could enhance performance of cattle. The use of it's by products shows significant result on cattle's performance. However, further treatment were needed to maintain their nutrients quality as needed to expand their storage time.

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