Effect as Feed Supplement Wafer the Nutrient Consumption and Digestibility of Pasundan Cattle

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ABSTRACT

The research was conducted of lamtoro wafer suplement on the feed intake and digestibility of pasundan cattle. Total samples of 20 cattle were taken from population of pasundan cattle were collected from Balai Pengembangan Perbibitan Ternak Sapi Potong in cijeungjing/ciamis, west java. The treatments were to P0 = conventional feed, P1 = conventional feed + 5% lamtoro wafer suplement, P2 = conventional feed + 10% lamtoro wafer suplement, and P3 = conventional feed + 15% lamtoro wafer suplement. The results showed that the addition of wafer containing lamtoro wafer suplement with a significant effect level 15% ($P<0.05$) consumption of dry matter (3404.69 g/head/day), consumption of crude protein (436.12 g/head/day), consumption of crude fat (250.91 g/head/day), and consumption of crude fiber (651.89 g/head/day). However, the addition of lamtoro wafer suplement was not significant effect ($P>0.05$) to digestibility of dry matter (68.54%), and digestibility of organic matter (72.40%). In conclusion, the addition of lamtoro wafer suplements into the rations could increase the feed and *L. leucocephala* wafer at 15% showed the best nutrient consumption of pasundan cattle.

Keywords: Pasundan cattle, Digestibility, Lamtoro wafer suplement

INTRODUCTION

The meat consumption from of an animal source increased with the increasing total of person in Indonesia. The fulfillment of meat needs including beef cattle was constrained by the total population of beef cattle. One alternative way to overcome the problem is to use local beef cattle to be used as cattle. Pasundan cattle is one of the original local cattle of West Java.

The development of beef cattle productivity was constrained by the availability of forage feed materials. Increased beef cattle production should be followed by adequate forage provision because forage is the main feed of ruminants. Forage feed itself availability fluctuate especially during the dry season so that the number was limited. Another obstacle in increasing the productivity of cattle is the lack of nutrient content in the feed. To overcome these problems required the addition of feed in the form of wafers containing lamtoro leaf.

Lamtoro leaf has a crude protein content ranging from 25% - 32% (Askar 1997). According to by Retnani *et al.* (2014) wafer lamtoro leaf contains 32% crude protein content dry matter digestibility 82.87% and organic matter 81.78%. Wafer is one of the alternative feed making techniques during an effective drought to improve the palatability and consumption of nutrients in cattle (Retnani 2014). *Leucaena leucocephala* should was limited because it contains antinutrisi mimosin. Mimosin levels in leaves was decreased by heating process (Meulen *et al.* 1979). Wood *et al.* (2003) states that there is a decrease in leaf mimosine levels of lamtoro due to heating at a temperature of 60^0C and 145^0C at 43%. Processing technology feed is a form of wafer made by using heating and pressing aid that was eliminated mimosin levels in lamtoro leaf (Retnani 2011). This study refers to the results of previous studies showing that the maintenance of beef cattle for a month given a wafer feed supplement containing 10% lamtoro leaf was increase body weight 69% higher than conventional feed (Retnani *et al.* 2014).

MATERIALS AND METHODS

The experiment used 20 heads of thin tail cattle. The experiment was conducted in the experimental from Balai Pengembangan Perbibitan Ternak Sapi Potong in cijeungjing/ciamis, west java.

Table 1. Nutrien content of conventional feed BPPT-SP Ciamis and lamtoro wafer suplement in 100% dry matter

Rations material	Nutrien % dry matter						
	Dry matter	Ash	Crude protein	Crude fat	Crude fiber	BETN	TDN
Wafer lamtoro leaf	90.63	11.40	25.05	5.68	9.86	48.01	71.12
Elephan grass	21.00	17.27	11.39	2.77	27.52	41.05	49.70
Rice brans	91.06	10.25	13.18	14.62	10.41	51.54	73.79
Rice straw	47.95	16.90	4.15	1.47	32.50	44.98	43.20

Note: Results of Inter-University Laboratory of Bogor Agricultural University (2016), BETN: extract without nitrogen, TDN: *total digestible nutrient*, TDN calculation formula according to Hartadi *et al.* (1980): -133, 726 - 0.2574 (SK) + 19,593 (LK) + 2,784 (Beta-N) + 2,315 (PK) + 0,028 (SK) 2 - 0,341 (LK) 2 - 0,008 (SK) Beta-N) - 0.215 (LK) (Beta-N) - 0.193 (LK) (PK) + 0.004 (LK) 2 (PK).

Tabel 2. Composition of experimental rations (%)

Ingredient	Type of rations			
	P0	P1	P2	P3
Elephant grass	20.90	19.90	19.00	18.17
Rice brans	51.80	49.33	47.09	45.04
Rice straw	27.30	26.00	24.82	23.74
Wafer lamtoro leaf	0.00	5.00	10.00	15.00

Tabel 3. Nutrient Composition of experimental rations (%)

Nutrient	Type of rations			
	P0	P1	P2	P3
Ash	13.53	14.10	14.67	15.24
Crude protein	10.34	11.59	12.85	14.10
Crude fat	8.55	8.84	9.12	9.41
Crude fiber	20.01	20.51	21.00	21.49
BETN	47.56	49.96	52.36	54.76
Total digestible nutrien	60.41	63.96	67.52	71.08

Data collection digestibility

Collection period was designed to record and measure the digestibility of nutriens. This period was conducted for 1 weeks. During this period, the feces were collected daily for 24 hours and the samples of feed were collected dail. The weight of the feces recorded and 10% of the total weight of the feces was collected for sample analysis.

Experimental design of the second research

The experimental design of the second steps used in this research was a randomized blok design with four treatments and five replications. The treatments were wafer of feed suplement production composition i.e : P0 (100% of conventional feed), P1 (conventional feed + 5% lamtoro wafer suplement), P2 (conventional feed + 10% lamtoro wafer suplement), P3 (conventional feed + 15% lamtoro wafer suplement) conventional feed were elephant grass, rice brans, and Rice straw. The data was analyzed with the analysis of variance, and the differences among treatments were examined with orthogonal contrast (Steel dan Torrie 1995). The parameters measured were nutrient consumption, dry matter digestibility, and organic matter digestibility. The variabels that would be measured were:

Dry matter consumption

Dry matter consumption = (feed consumption – rest feed) x % dry matter

Crude protein consumption

Crude protein consumption = dry matter consumption x % crude protein

Crude fat consumption

Crude fat consumption = dry matter consumption x % crude fat

Crude fiber consumption

Crude fiber consumption = dry matter consumption x % crude fiber

Dry matter digestibility

The digestibility of coefficient dry matter (DCDM) was calculated by the following formula:

$$\text{DCDM\%} = \frac{\text{dry matter consumption} - \text{dry matter of feses}}{\text{dry matter consumption}} \text{ x } 100\%$$

Organic matter digestibility

The digestibility of coefficient organic matter (DCOM) was calculated by the following formula:

$$\text{DCOM\%} = \frac{\text{organic matter consumption} - \text{organic matter of feses}}{\text{organic matter consumption}} \text{ x } 100\%$$

The process of wafer of feed supplement production was conducted by chopping, drying, mixing, preassing, heating and forming with temperature of 100^0C for 10 minutes to get wafer of feed supplement and then being cooled in room temperature (Fig. 1).

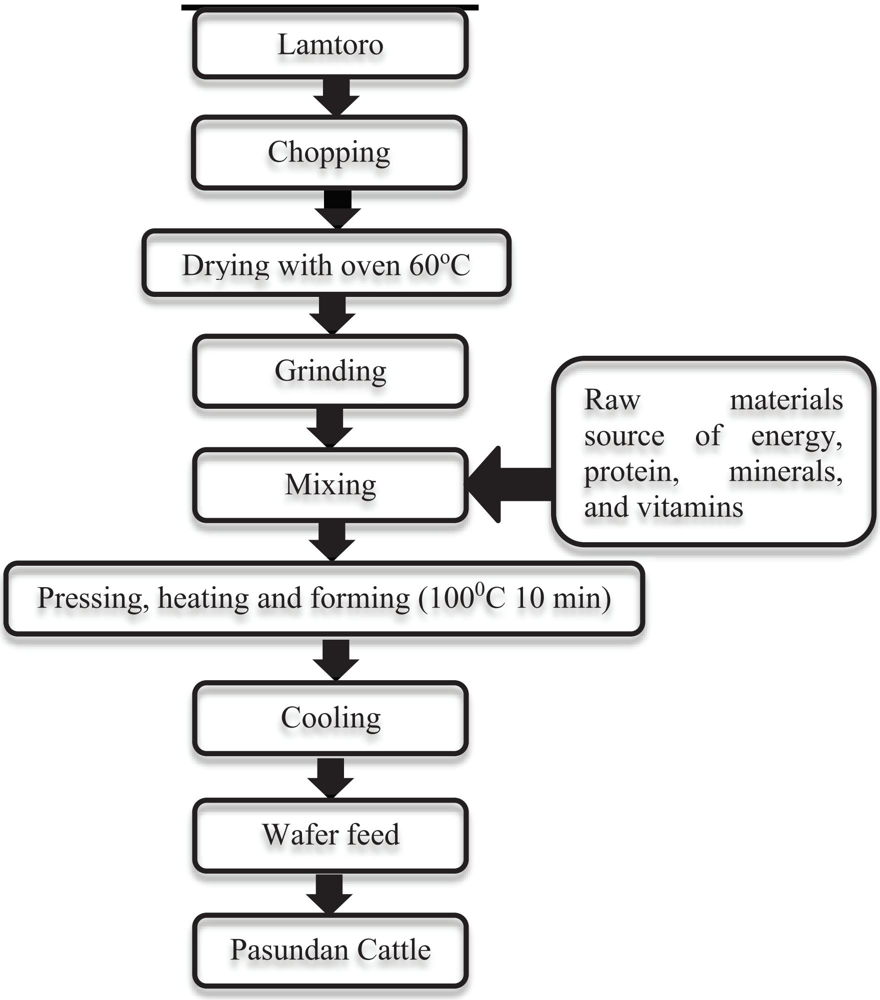

Figure 1. Diagram process of wafer feed production (Retnani *et al.* 2014)

RESULTS AND DISCUSSION

Nutrient comsumption

The analysis of variance showed that the level of lamtoro wafer supplementation in the ration significantly increased ($P<0.05$) to the comsumption of dry matter, crude protein, crude fat, and crude fiber (Table 4).

The dry matter comsumption of the experimental diets ranged from 2819.22 g/head/day to 2819.22 g/head/day, and the crude protein comsumption ranged from 284.23 g/head/day to 436.12 g/head/day. The highest consumption dry matter and crude protein consumption in the present of 15% wafer lamtoro supplement, this is directly proportional to the consumption of crude protein. The increased consumption of dry matter is due to the increased crude protein content in the feed. Utomo and Soejono (1999) stated that much of the nutrient intake depends on the amount of dry feed ingredients consumed by livestock and nutrient content in the diets. Furthermore explained by Riswandi *et al.* (2015) the addition of lamtoro leaf may increased the consumption of dry matter, organic matter, and crude protein.

Table 4. Nutrient consumption lamtoro wafer suplement

Nutrient consumption	Type of rations			
	P0	P1	P2	P3
Dry matter (g/head/day)	2819.22±44.94d	3051.37±74.13c	3192.06±48.83b	3404.69±52.65a
Crude protein (g/head/day)	284.23±7.14d	341.25±8.61c	380.03±6.03b	436.12±7.91a
Crude fat (g/head/day)	220.72±8.17d	233.08±8.89c	236.15±7.63b	250.91±8.39a
Crude fiber (g/head/day)	595.65±4.98d	620.34±15.12c	636.44±9.98b	651.89±6.97a

Note: Means in the same row with different superscripts differ significantly (P<0.05). Ration P0 (100% of conventional feed), P1 (conventional feed + 5% lamtoro wafer suplement), P2 (conventional feed + 10% lamtoro wafer suplement), P3 (conventional feed + 15% lamtoro wafer suplement).

The crude fat comsumption of the experimental diets ranged from 220.72 g/head/day to 250.91 g/head/day, and the crude fiber comsumption ranged from 595.65 g/head/day to 651.89 g/head/day. the was fathomed on the increase of each treatment with the addition supplementation of wafer lamtoro containing coarse fat and coarse fiber high in the feed. Manso (2006) the explain that grease digestibility of crude fat increased with the addition of the amount of fat in the diets. This is because the influence of the consumption of dry matter is also increasing.

Nutrient Digestibility

The analysis of variance showed that the level lamtoro wafer supplementation in the ration did not affect (P>0.05) the digestibility of dry matter, and organic matter (Table 5).

Table 5. Digestibility lamtoro wafer suplement

Digestibilities	Type of rations			
	P0	P1	P2	P3
Dry matter digestibility (%)	59.42±0.95	65.01±6.18	62.52±2.90	68.54±5.43
Organic matter digestibility (%)	64.24±0.67	69.03±5.90	67.29±2.65	72.40±4.90

Note: Ration P0 (100% of conventional feed), P1 (conventional feed + 5% lamtoro wafer suplement), P2 (conventional feed + 10% lamtoro wafer suplement), P3 (conventional feed + 15% lamtoro wafer suplement).

The dry matter digestibility of the experimental diets ranged from 59.42% to 68.54% and the digestibility organic matter ranged from 64.24% to 72.40%. The digestibility of organic matter decreased due to the increased feed comsumption since the retention time of the feed in the digestive tract became shorter that eventually decreased the fermentation of feed by rumen microbes (Church, 1988). The difference in each treatment was due to the feed composition in feed, the statement of by McDonald *et al.* (2011) factors that affect digestibility, among others, feed content, feed composition, feed processing, feeding level, and livestock factors.

CONCLUSIONS

The lamtoro wafer supplementation could not improve the digestibility dry matter, and Organic matter. However, lamtoro wafer supplementation at the level 15% gave the best result on dry matter, crude protein, crude fat, and crude fiber in pasundan cattle.

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