



## **Effects of Administration of Combination of Palm Kernel Meal, Katuk Leaf and Betel Nut Powder on Sensory Value of Meat In The Goat**

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### **Abstract**

In goats, we tested the sensory value of meat in the goat after oral treatment with palm kernel meal (PK), katuk leaf powder (KL) and betel nut powder (BN), separately and in combination. This study were used 8 Boerka goats that allocated among four groups of 2: the Control group was given distilled water; PK only was given to Group P1; a combination of all three was administered to Group PK-KL-BN, and a combination of KL and BN was administered to Group KL-BN. All treatments were administered orally for 35 consecutive days. animals were weighed before treatment (Day 0) and on Day 40 (5 days after the end of treatment). On day of 40, the animals were slaughtered using halal standard. Then, sample of meat was taken from bicep femoris of right leg of each animals for sensory evaluation, which comprised of tenderness, colour, aroma, taste, and juiciness. A number of 30 panelist were involved in the evaluation. The results showed that the meat were tender in the group of PK-KL-BN and KL-BN (the hedonic scale of 2, tender). Then, for the other parameters were not different between groups. In conclusion, the administration of combination of palm kernel meal, katuk leaf powder and betel nut powder, can improve the tendernes of meat in goats.

*Key words: sensory; meat; goats; palm kernel meal; katuk leaf powder; betel nut powder*

### **Background**

Nowadays, In Indonesia the consumer is decided to purchase meat based on several considerations. Some of them might concern on the price of that product. In addition, most of them are also concerned on the quality of meat, such as its hygienic value. The main aspect in the hygienic value that important for the consumers is the safety of meat product.

The safety of meat is need to be prepare since the product in its production system. It is the application of concept of 'from farm to the table' <sup>1,2</sup>. For example, at farm level, the animals should be fed with safety feed and treated using safety veterinary drug. Otherwise, the livestock

animals may suffers side effect after administration of those or resulted in inefficacy of treatment. In turn, the consumers could also affected when they consume this contaminated product. Therefore, it is important now to start for developing a strategy for quality control of meat product in livestock using a "clean, green, and ethical" (CGE) approach of technology for the future<sup>1,3</sup>.

Among CGE approach is the application of natural method for stimulation of production performance in livestock animals. For example, the utilization of herbal coumpound such as palm kernel meal, katuk leaf powder (*Sauropus androgynus* L. Merr), and betel nut (*Areca*

catechu L.) powder. A combination of supplementation of those natural compound has been reported could improve the production performance and acted as anthelmintic in goat<sup>3,4,5</sup>. Therefore, this supplementation can be one alternative for application of CGE approach, but need to be studied further for other aspect of consumers concern.

Interestingly, several reports have been suggested that the sensory value of meat, such as colour, tenderness, juiciness, and aroma or flavor are also influences the consumer choice<sup>6,7,8</sup>. Therefore, in this study we have tested the sensory value of meat in the goat after oral treatment with palm kernel meal, katuk leaf powder (*Sauropus androgynus* L. Merr), and betel nut (*Areca catechu* L.) powder, both separately and in combination.

## Materials and Methods

### Preparation of Palm Kernel Meal

Raw palm kernel meal (hereafter, PK) waste were collected from local palm oil processing plant in North Sumatera. This material was processing naturally by drying under the sunshine for 16 hours.

### Preparation of Katuk Leaf Powder and Betel Nut Powder

The production of powder of katuk leaves (hereafter, KL) was conducted by modified the processing method of Suprayogi et al.<sup>9</sup> by Ferasyi et al.<sup>10</sup>. Then, the processing of betel nut powder (hereafter, BN) was based on Athaillah<sup>11</sup>.

### Animal Treatment

This study were used 8 male Boerka goats that at  $\pm 1.5$  years old. Initially, all animals were acclimatized for 14 days. Every day, they were fed native pasture and grass as well as access to water ad libitum. Then, after passed acclimatization period, by using a Complete Random Design (CRD) approach, all goats were placed randomly in individual cage, and divided into 4 different treatment groups (Each group comprised of 2 goats). The groups were one control group (P0) and three different treatment groups (P1, P2, and P3), as follow:

- Control group (P0), which was given distilled water at 500 ml/day.
- First treatment group (P1), which was administered with only PK at 100 g/day per goat.
- Second treatment group (P2), which was given a combination of PK (at 100 g/day) and KL (at 7.5 g/day) and BN (at 15 g/day) per goat; and,
- Third treatment group (P3), which was given only KL (at 7.5 g/day) and BN (at 15 g/day) per goat per goat.

All treatments were administered orally for 35 consecutive days. animals were weighed before treatment (Day 0) and on Day 40 (5 days after the end of treatment). On day of 40, the animals were slaughtered using halal standard.

Then, sample of meat were taken from bicep femoris of right leg at 100 g of each animals in the treatment groups. All of sample were used for sensory evaluation based on Soekarto and Hubeis (1992) cited by Hafid et al.<sup>12</sup>, which comprised of tenderness, colour, aroma (flavor), taste, and juiciness. The raw meat that obtained after animal slaughter was used for evaluation colour and aroma. Then, the cooked meat, by frying, was used for testing of tenderness, taste, and juiciness. The approach for sensory test was using the criteria of hedonic scale evaluation as described in Soekarto (1985) cited by Hafid and Syam<sup>13</sup> (Table 1). A number of 30 panelist were involved in the evaluation.

### Data Analysis

Data obtained from this study were analyzed using the following equation at 95% of confidence interval (SNI SNI 01-2346-2006):

$$P(\bar{x} - (1.96 s \sqrt{n})) \leq \mu \leq (\bar{x} + (1.96 s \sqrt{n})) \cong 95\%$$

Where :

$\bar{x}$  : average score of evaluation from all panelist

s : standard deviation

n : number of panelist

Table 1. The criteria of hedonic scale that used for sensory evaluation of meat.

Sensory Evaluation	Hedonic Scale	Criteria
Tenderness	1	Very tender
	2	Tender
	3	Moderately tender
	4	Tough
	5	Very tough
Colour	1	Pink
	2	Bright red
	3	red
	4	Red disk to dark brown
	5	Dark brown
Aroma	1	Very well accepted
	2	Well accepted
	3	Accepted
	4	Not accepted
	5	Very not accepted
Taste	1	Very well accepted
	2	Well accepted
	3	Accepted
	4	Not accepted
	5	Very not accepted
Juiciness	1	Very juicy
	2	Mild juicy
	3	Juicy
	4	Almost juicy
	5	Dry

## Results and Discussion

This is the first study, as far as we know, that testing the effects of combination of palm kernel meal, katuk leaf powder (*Sauropus androgynus* L. Merr), and betel nut (*Areca catechu* L.) powder to the change of sensory value in goat meat. In particular, the evaluation was focused on the change in tenderness, colour, aroma (flavor), taste, and juiciness of meat.

The results of this study showed that the tenderness of meat were classified as tender in the group of PK-KL-BN and KL-BN. Most of panellist were choose the hedonic scale of 2 (tender) for that sensory value as shown in Table 2. On the other hand, in the control and given PK only

groups were evaluated as moderately tender (score of 3). Then, the aroma of meat was valued as 'well accepted' (score of 2) in most of treatment group. Only in the treatment group with KL-BN that was found the aroma of meat with category of 'accepted' (score of evaluation of 3). In general, for the other variables of sensory value (colour, taste, and juiciness) were not different between groups.

Table 2. The results of sensory evaluation of meat after given palm kernel meal (PK), katuk leaf powder (KL), and betel nut powder (BN), separately and in combination, based on hedonic scale in goat.

Treatment Group	Tenderness	Colour	Aroma	Taste	Juiciness
Control	3	2	2	2	3
PK	3	2	2	2	3
PK-KL-BN	2	2	2	2	3
KL-BN	2	2	3	2	3

The meat that was found as tender in the treatment groups that given a combination of palm kernel meal, katuk leaf powder, and betel nut powder, perhaps caused by low infection of gastrointestinal nematode. In our former study it was found that the number of eggs per gram faeces (EPG) was significantly reduced 40 days after treatment with those combination<sup>5</sup>. Possibly, the anthelmintic effect of these supplements was resulted in reduction of stress in the animals. In turn, it may produce meat with a good quality, for example the variable of tenderness<sup>14</sup>.

Several reports have suggested that the tenderness of meat is influenced by the increase of lactic acid<sup>15,16</sup>. It is possible that the administration of the herbal compound above also affected the change of level of lactic acid in the meat. For example, the palm kernel cake has been reported could influence the production of lactic acid in the meat of young bulls, which was assumed based on change of pH<sup>17</sup>. However, this theory need to be proven in future study.

## Conclusion

We concluded that the administration of combination of palm kernel meal, katuk leaf powder and betel nut

powder, can improve the tenderness and aroma of meat in goats.

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