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## Implementation of palm kernel cake complete feed wafers based on weaning Ongole crossbreed

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# Implementation of palm kernel cake complete feed wafers based on weaning Ongole crossbreed

Y Sukaryana\*, Zairiful, Y Priabudiman and I Panjaitan

Department of Animal Husbandry, Politeknik Negeri Lampung, Jl. Soekarno-Hatta, No.10, Rajabasa–Bandar Lampung, Provinsi Lampung, Indonesia.

E-mail: \*y\_sukaryana@polinela.ac.id

**Abstract.** The purpose of this study was to examine the implementation of palm kernel cake-based complete feed wafers on weaning Ongole crossbreed. The design used was a completely randomized design consisting of 4 treatments and 3 replications. Each treatment consists of a complete feed wafers formulation based on different palm kernel cake, namely formulation 1, formulation 2, formulation 3, and formulation 4. The results showed that the administration of complete feed based on palm kernel cake does not affect feed consumption (in dry matter). Feeding formulation 4 was significantly different ( $P < 0.05$ ) compared to all treatments, formulation 3 had a very significant effect ( $P < 0.05$ ) compared to formulation 2 and formulation 1, while formulation 2 and formulation 1 were not different.

## 1. Introduction

Feed is an important component in livestock raising. The cost of feed is the biggest cost of the total production costs which is 70-80%. The limitation of feed causes the capacity of livestock in an area to decrease and causes production and reproductive disturbances. The solution to this problem is to utilize agricultural / industrial waste in the livestock business. This effort is not something that is excessive considering that Indonesia is an agricultural country. To utilize agricultural / industrial waste, it must be known precisely the value of use and its usefulness and know the right technology to manage it.

According to [1], agricultural waste generally has a low protein, digestibility and palatability content. Besides that its voluminous nature makes it difficult to handle, both during transportation and storage, so it requires a way to increase the value of the use of agricultural waste. In addition [2], it was observed that complaining feed blocks (CFB) from palm fronds can be used as ruminant animal feed but must also pay attention to aspects of quality and palatability. This can be overcome by making wafer feed technology. Wafer feed is a complete feed, which is a processed animal feed product consisting of fibre source feed namely forage and or agricultural waste, as well as concentrates with adjusted composition based on the nutritional needs of livestock and in the manufacturing process experiencing compaction. The main constraints of the use of grass and agricultural waste include transportation, because in general grass or agricultural waste requires a large place for each unit of weight. With the application of feed processing technologies such as counting grass and agricultural waste that is processed into wafers for livestock, it can improve quality and palatability and facilitate transportation.

Wafer is an effective feed processing technology and is expected to maintain the continuity of feed availability, especially during the dry season. The results of the study [3] stated that complete feed wafer products were well received, with a level of interest of 57%. How to make wafer feed; grass and



agricultural waste are chopped, with a size of 3-5 cm in order to accelerate the drying process and facilitate mixing with adhesive materials.

Alternative materials that are potential enough to be available continuously for the scale of the plant include palm kernel cake. Palm kernel cake is a waste of palm oil processing plant which is abundant and does not compete with human needs. Palm kernel cake contains quite high crude protein which is 15-20% [6]. Palm kernel cake which is abundant in Sumatra, especially in Lampung province is still not used to be processed as wafer feed. Therefore, the development of palm kernel cake-based wafer processing technology has very good prospects in the field of animal husbandry, especially beef cattle.

## 2. Materials and methods

This study used 12 weaned Ongole crossbreed cattle with an initial weight of around 80-90 kg. The design used was a completely randomized design consisting of 4 treatments and 3 replications in each treatment. Each treatment consists of a complete feed wafer formulation based on different palm kernel cake, namely formulation 1, formulation 2, formulation 3, and formulation 4. Complete feed wafers given during the study using feed ingredients including: elephant grass, palm kernel cake, corn flour, rice bran, tapioca waste, molasses, and premix. Feeding is carried out 2 times, namely in the morning and evening with the amount of ad libitum giving. Maintenance time is 30 days.

**Table 1.** Formulations complete feed wafers based on palm kernel cake

| Feedstuff                   | Formulation 1 | Formulation 2 | Formulation 3 | Formulation 4 |
|-----------------------------|---------------|---------------|---------------|---------------|
|                             | ..... % ..... |               |               |               |
| <i>Pennisetum purpureum</i> | 50            | 40            | 30            | 20            |
| Palm kernel cake            | 20            | 30            | 40            | 50            |
| Corn flour                  | 15            | 15            | 15            | 15            |
| Rice bran                   | 5             | 5             | 5             | 5             |
| Tapioca waste               | 5             | 5             | 5             | 5             |
| Molasses                    | 5             | 5             | 5             | 5             |
| Premix                      | 0.5           | 0.5           | 0.5           | 0.5           |

**Table 2.** The content of nutrition complete feed wafers of analysis results

| Nutritions             | Formulation 1 | Formulation 2 | Formulation 3 | Formulation 4 |
|------------------------|---------------|---------------|---------------|---------------|
|                        | ..... % ..... |               |               |               |
| Dry matter             | 80.0          | 82.5          | 85.0          | 87.5          |
| Moisture               | 20.0          | 17.5          | 15.0          | 12.5          |
| Crude protein          | 15.2          | 15.7          | 16.0          | 16.4          |
| Crude fibre            | 35.4          | 33.5          | 30.5          | 29.5          |
| Crude fat              | 4.5           | 5.8           | 6.7           | 7.5           |
| Ash                    | 12.5          | 14.5          | 15.5          | 16.5          |
| Nitrogen free extracts | 12.4          | 13.0          | 16.3          | 17.6          |

Source: Analysis at the Laboratory of Nutrition and Animal Feed in Polinela (Polytechnic of Lampung)

## 3. Results and discussion

### 3.1. Feed consumption

Consumption of complete feed wafers based on palm kernel cake on weaning breeds is the ability to spend a certain amount of feed given ad libitum.

**Table 3.** Consumption average of complete feed wafers based on palm kernel cake on weaning Ongole crossbreed.

| Dry matter<br>Consumptions | Formulation<br>1 | Formulation<br>2 | Formulation<br>3 | Formulation<br>4 | Total |
|----------------------------|------------------|------------------|------------------|------------------|-------|
|                            | kg .....         |                  |                  |                  |       |
| Replicate 1                | 2.2              | 2.1              | 2.3              | 2.3              | 8.9   |
| Replicate 2                | 2.1              | 2.3              | 2.1              | 2.2              | 8.7   |
| Replicate 3                | 2.1              | 2.1              | 2.2              | 2.2              | 8.6   |
| Total                      | 6.4              | 6.5              | 6.6              | 6.7              |       |
| Average                    | 2.13             | 2.16             | 2.20             | 2.23             |       |

Based on the analysis of variance, it was found that the administration of complete feed wafers based on palm kernel cake had no significant effect ( $P > 0.05$ ) on feed consumption (in dry matter) in weaning Ongole breeds. Unreal results on feed consumption can be influenced by many factors both from the condition of the cow itself and from other factors such as food and the environment. The relatively young age of cattle can affect feed consumption, because the ability of the rumen which is not good enough to digest the food used is palm kernel cake which has very high crude fibre. Cow health conditions that are not good can also be possible factors that influence the amount of consumption. The unreal results obtained from the analysis are in accordance with the results of the study [5] which examined the 50% oil palm fronds also had no significant effect ( $P > 0.05$ ). Feed consumption is also influenced by internal factors of livestock such as feed palatability and the level of digestibility of the food consumed, the higher the digestibility level of feed it will increase feed consumption [4]. So that the amount of nutrients used for production will increase. This can be seen from the nutritional content of almost the same feed.

### 3.2. Average daily gain increase

Average daily gain is the result of a reduction in the amount of the final weighing weight reduced by the initial weight and divided by the length of maintenance carried out i.e. for 30 days. The average daily gain during treatment can be seen in Table 4.

**Table 4.** Average daily gain for weaning Ongole crossbreed

| Average daily gain<br>Increase | Formulation<br>1  | Formulation<br>2  | Formulation<br>3  | Formulation<br>4  | Total |
|--------------------------------|-------------------|-------------------|-------------------|-------------------|-------|
|                                | kg .....          |                   |                   |                   |       |
| Replicate 1                    | 0.9               | 1.1               | 1.0               | 1.3               | 4.3   |
| Replicate 2                    | 1.0               | 0.9               | 0.9               | 1.2               | 4.0   |
| Replicate 3                    | 0.8               | 0.8               | 1.2               | 1.2               | 4.0   |
| Total                          | 2.7               | 2.8               | 3.1               | 3.7               |       |
| Average                        | 0.90 <sup>c</sup> | 0.93 <sup>c</sup> | 1.03 <sup>b</sup> | 1.23 <sup>a</sup> |       |

The effect of complete feed wafer feed based on palm kernel cake on average daily gain can be determined by analysis of variance. Based on the analysis of variance, feeding formulation 4 was very significant ( $P < 0.05$ ) compared to all treatments, formulation 3 had a very significant effect ( $P < 0.05$ ) compared to formulation 2 and formulation 1, while formulation 2 and formulation 1 giving no significant effect ( $P > 0.05$ ). Cattle weight gain is very dependent on feed and its ability to use feed [4]. This condition can be caused by many factors, including; age, sex, environment, and genetics, where the initial body weight of the fattening phase is related to adult weight. Another factor that is very influential is the nutrient content of feed. The crude protein content in formulation 4 is the highest compared to other formulas, resulting in the highest body weight gain.

#### 4. Conclusions

The results showed that giving wafer complete feed based on palm kernel cake had no effect on feed consumption (in dry matter). Feeding formulation 4 was very significantly different ( $P < 0.05$ ) compared to all treatments, formulation 3 was very significant ( $P < 0.05$ ) compared to formulation 2 and formulation 1, while formulation 2 and formulation 1 were not different.

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