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The Effect of Coconut Drugs Fermentation (Cocos Nucifera L) with Cytophilal Neurospora on in-Vitro Digestiveness

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Abstract

The purpose of this study was to determine the effect of fermented coconut pulp (Cocos nucifera L) with Neurospora sitophila on digestibility in vitro. This research was conducted in July – September 2021 at the Laboratory of the Faculty of Agriculture and Animal Husbandry, University of Muhammadiyah Bengkulu and Proximate Analysis at the Livestock Dairy Laboratory, Bogor Agricultural University (IPB). This study used a completely randomized design (CRD) consisting of 4 treatments and 4 replications. Neurospora Sitophila fermented coconut dregs with a composition of 1.5 Kg of coconut dregs and 10% molasses with a dose of Neurospora Sitophila P1 = 2%, P2 = 4%, P3 = 6%, and P4 = 8%. The parameters observed were dry matter digestibility and organic matter digestibility. The results of this study were coconut pulp fermented with Neurospora Sitophila with different doses was able to increase dry matter digestibility and organic matter digestibility. The result of this research is that fermented coconut pulp using Neurospora sitophila with different doses can increase digestibility in vitro. Dry matter digestibility (69.32% - 74.68%) and organic matter digestibility. (69.08% - 74.70%). In conclusion, coconut pulp fermentation with Neurospora sitophila can increase dry matter digestibility (KcBK) and organic matter digestibility (KcBO). The best level in the P3 treatment is 6%.

Keywords: *Coconut Dregs; Fermentation; Neurospora Sitophila; In-vitro Digestibility*

Introduction

Market waste that can be used as animal feed is coconut dregs which are waste from coconuts that have been separated from the coconut milk. Coconut dregs are a by-product of industrial waste or household waste that has the potential to be used as a feed ingredient (Miskiyah & Haliza, 2006). Coconut dregs can be used as animal feed for both poultry and ruminants because coconut dregs are still widely found in the market and have not been used optimally. Apart from a large amount of potential for coconut dregs on the market, coconut dregs also have a fairly good nutritional content. According to Putri, (2010), the nutrient content contained in coconut dregs is Protein 5.78%; Fat 38.24%. Meanwhile, according to

Elyana (2011), the content of coconut dregs includes water 13.35%; Protein 17.09%; Fat 9.44%; Carbohydrates 23.77%; Ash 5.92%; and 35.4% Crude Fiber.

Besides having good nutritional content, coconut pulp also has many disadvantages such as high-fat content, easy to spoil, smells bad, and cannot be stored for a long time. So more optimal processing is needed, such as fermentation technology. Fermentation is one way to process coconut dregs into animal feed ingredients which can be complexly converted into simpler compounds with the help of enzymes from microorganisms (Hidayati, 2017).

The microbe used in the coconut dregs fermentation process is Neurospora sitophila or known as red oncom mold, this mold grows on media containing cellulose and produces the enzyme β-glucosidase. This mold also has a high lipolytic activity which hydrolyzes triglycerides into free fatty acids so that it can increase the digestibility of organic matter (KCBO). According to Goetsch and Owens (1985), supplementation of silage rations with compounds similar to Neurospora sitophila, was able to improve dry matter digestibility (KCBK) and KCBO in the entire digestive tract. Based on this phenomenon, a research entitled "Fermentation of Coconut Dregs (Cocos nucifera L) with Neurospora sitophila and Effect on In-vitro Digestibility" will be carried out.

Method

This research was carried out from July to September 2021 at the Laboratory of the Faculty of Agriculture and Animal Husbandry, Muhammadiyah University of Bengkulu, and proximate analysis were carried out at the Laboratory of Dairy Animal Husbandry, Bogor Agricultural University (IPB). The tools used in this study were table tarpaulin/plastic, scales, basins or buckets, brushes, plastic, steamer pots, cameras, label paper, permanent markers, laboratory equipment, gloves, masks, and hand sanitizers. The materials used are Coconut dregs, Neurospora sitophila mold, and Molasses. The design used was a completely randomized design (CRD) with formulations namely, P1 = 2% Neurospora sitophila, P2 = 4% Neurospora sitophila, P3 = 6% Neurospora sitophila, P4 = 8% Neurospora sitophila. In this study there were 4 treatments and 4 repetitions so 16 experimental units were obtained.

Finding and Discussion

1. Digestibility of Dry Matter (KcBK)

Average Digestibility of Dry Matter (KcBK) in fermented coconut dregs with Neurospora sitophila in vitro can be seen in table 1 below:

Table 1. Average Digestibility of Dry Matter (KcBK) (%)

Treatment	Average	
P1	69.32^{a}	±0.80
P2	71.92^{b}	±0.26
P3	74.39^{c}	±0.48
P4	74.68^{c}	±0.50

Note: Different superscripts in the same column show a significant difference ($p < 0.05$)

The results of the analysis showed that fermented coconut dregs with Neurospora sitophila at different levels had a very significant ($P<0.01$) effect on dry matter digestibility (KcBK). The results of the DMRT follow-up test showed that the P1 and P2 treatments were significantly different from the P3 and P4 treatments.

From this study, there was an increase in dry matter digestibility sequentially from treatment P1 to P4. There was an increase in dry matter digestibility of 7.18% from 69.32 to 74.68. The increase in the digestibility of this dry matter is due to the presence of Neurospora sitophilla which breaks down the coconut dregs in which the complex components become simpler so that they are easier to digest.

This is in accordance with the opinion of Nurhaita et al (2012) Fermentation can improve certain properties of materials such as making them easier to digest, more resistant to storage, and can remove toxic compounds contained in them, so that the economic value of the basic ingredients becomes better.

Kusumaningrum and Dewanti (2012) said that cellulase produced from Neurospora sitophila will break down cellulose into glucose which is then used as a source of carbon and energy. Yulistiani et al. (2000) reported in their research that fermented corn cobs with Neurospora sitophila with the addition of urea obtained a dry matter digestibility (KcBK) of 50.9%.

The results of fermented coconut dregs with Neurospora sitophila in this study resulted in a high dry matter digestibility of 69.32% - 74.68% higher than the digestibility of Elephant Grass (Pennisetum Purpureum Schumach & Thonn) of 40.12% - 59.98% , (Wibowo et al, 2017).

This means that the fermentation of coconut dregs with Neurospora sitophila is better in terms of digestibility and increases shelf life so that it is good for animal feed. The factors that affect the digestibility of dry matter are the crude fiber content, and the high or low crude fiber content will affect the ability of microbes to digest crude fiber affects the digestibility value of the dry matter. Digestibility of feed is closely related to the chemical composition of crude fiber and crude protein content (Sakinah, 2005), where Sakinah (2005) states that high digestibility indicates the number of nutrients distributed to livestock, dry matter is one of the results of fraction derived from feed ingredients. after reducing the water content.

2. Digestibility of Organic Matter (KcBO)

Average Digestibility of Organic Matter (KcBO) in fermented coconut dregs with Neurospora sitophila in-vitro can be seen in table 2 below:

Table 2. Average Digestibility of Organic Matte (KcBO) (%)

Treatment	Average
P1	$69.08^{a} \pm 0,10$
P2	$71.68^{b} \pm 0,07$
P3	$74.20^{c} \pm 1,93$
P4	$74.70^{c} \pm 0,32$

Source: Processed Data

The results of the analysis of variance (Appendix 3) showed that fermented coconut dregs with Neurospora sitophila had a very significant ($P<0.01$) effect on the digestibility of organic matter (KcBO). The DMRT follow-up test results showed that the P1 and P2 treatments were different from the P3 and P4 treatments. The average KcBO value is proportional to the KcBK value which is influenced by the ability of microbes to degrade organic matter. From this study, there was an increase in the digestibility of organic matter by 7.52% from 69.08 to 74.70.

From this study, the increase in the average digestibility of organic matter (KcBO) occurred sequentially in treatments P1, P2, P3 to P4 so that the increase in organic matter digestibility (KcBO) in this study was 8.12% from 69.08 to 74.70. higher than that carried out by Wibowo et al., (2017) in their research the in vitro digestibility value of elephant grass organic matter (KcBo) with organic and inorganic fertilization and effective microorganism inoculation (EM4) which resulted in organic matter digestibility of 40.23% -59 .12%.

Digestibility is how much nutrients can be absorbed by livestock, so digestibility is used as an indicator to determine the quality of feed for livestock. The organic matter digestibility value (KcBO) is almost the same as the dry matter digestibility value (KcBK) because the dry matter still contains ash. The ash content in feed ingredients can inhibit the digestion process so that organic matter is easier to digest. This is in accordance with the opinion of Muhtarudin (2007) which states that organic matter is dry matter that has been reduced by ash, while ash or inorganic materials include calcium, phosphorus, magnesium, potassium, and sodium. The increase in the digestibility value of organic matter (KcBO) is proportional to the increase in dry matter digestibility percentage (KcBK). Dry matter digestibility (KcBK) is very closely related to organic matter digestibility (KcBO), this is because most of the dry matter is organic matter. Tillman et al. (1998) stated that the digestibility of dry matter (KcBK) can affect the digestibility of organic matter (KcBO) so that an increase in the digestibility of dry matter (KcBK) will also lead to an increase in the digestibility of organic matter (KcBO). Affecting the digestibility of organic matter is the content of crude fiber and minerals from organic matter. feed. The digestibility of organic matter fiber is related to the digestibility of dry matter because most of the dry matter consists of organic matter (Fields, 2011).

Conclusion

Based on the results of the analysis and discussion, it can be concluded that fermented coconut dregs using Neurospora sitophila at different doses can increase digestibility in vitro. Digestibility of Dry Matter (69.32% - 74.68%) and Digestibility of Organic Matter. (69.08% - 74.70%). In conclusion, fermented coconut dregs with Neurospora sitophila can increase dry matter digestibility (KcBK) and organic matter digestibility (KcBO). The best level in the P3 treatment is 6%.

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