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Research Article

Digestibility of Indigofera Flour-Based Pellet Feed in Balitnak Chickens (KUB)

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Abstract: This study aims to evaluate the consumption of dry matter, organic matter, digestibility of dry matter, organic matter, and protein of pellet feed in KUB chickens containing indigofera flour (Indigofera sp). The method used was a completely randomized design with 3 (three) treatments and 6 (six) replications: (P1) commercial pellets, (P2) pellets with 5% indigofera flour, and (P3) pellets with 10% indigofera flour. A total of 18 chickens aged 10 weeks were placed randomly in individual cages. The results showed that indigofera flour (Indigofera sp) can be used up to 10% in KUB chicken pellet rations without reducing the digestibility of dry matter, organic matter, and protein. that indigofera flour (Indigofera sp) used up to 10% in KUB chicken pellet rations based on the digestibility value of dry matter, organic matter and protein

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INTRODUCTION

Improving the genetic quality of chickens can be done through selection (Dako et al., 2020), interbreeding of chickens with different breeds (Kunuti et al., 2021; Rafian et al., 2017) and optimal environmental improvement (Azis et al., 2023), such as improving feed (Hidayat, 2022; Sudarto et al., 2021).

Balitnak Superior Village Chicken (KUB) is the result of genetic selection of village chickens (Ismail et al., 2021; Pakaya et al., 2019). This chicken began to be developed in rural communities with semi-intensive to intensive maintenance methods, so it requires the provision of quality feed so that the stability of egg and meat production can be maintained.

The characteristics of KUB chickens are that they grow quickly and uniformly, have low mortality, adapt well to the rearing environment, and the taste of the meat is the same as that of native chickens (Kaleka, 2015; Suryana, 2017).

Protein source feed always experiences an increase in price (Gubali, 2021), for this reason, it is necessary to seek alternative feed, especially protein source feed ingredients that are easily obtained (Djunu et al., 2023), contain high protein (Hidayat, 2022), are continuously available and relatively cheap (Zainudin et al., 2024). Indigofera greens (Indigofera sp) are quality greens that can be evaluated through digestibility values, especially dry matter digestibility, organic matter and protein as an effort to vary the feed ingredients that make up quality rations through research or research will provide added value by producing feed that has an impact on the success of developing livestock businesses, especially KUB village chicken farms. So that it can produce livestock food products that can overcome the problem of fulfilling community nutrition (quantity of food consumption) from animal protein sources, so that food availability is achieved based on food security and independence. The purpose of this study was to evaluate dry matter,

MATERIAL AND METHOD

This research was conducted in a wet laboratory (poultry cage) of the Faculty of Animal Husbandry, Unsrat Manado. The research material was pellet feed utilizing indigofera leaf flour (Indigofera sp) formulated with corn, soybeans, fish meal, coconut cake, fine powder, supplement feed. The livestock used were 10-week-old total 108 ekor KUB chickens placed in 18 treatment cages

This study used a completely randomized design of 3 treatments with 6 replications. (Steel and Torrie, Treatments as follows:

P1 = Pellets without indigofera leaf flour (Indigofera sp)
P2 = Pellets with 5% indigofera leaf flour (Indigofera sp)
P3 = Pellets with 10% indigofera leaf flour (Indigofera sp).

The nutritional content of the ration is analyzed and compiled based on the needs of KUB chickens during the growth phase.

Table 1 . Composition of KUB Chicken Pellet Ration

Feed Ingredients *)	treatment		
	R1	R2	R3
Corn	52,5	52,5	52,5
Soybean Flour	10	5	0
Indigofera Flour	0	5	10
Fish Meal	12	12	12
Coconut Meal	10	10	10
Bran	15	15	15
Top Mix	0,5	0,5	0,5
	100	100	100
Sago flour	2	2	2

Note : *) Composition of Ration Ingredients

Table 2. Composition of Nutrion and Metabolic Energy of Research Rations

Nutrion*)	Perlakuan		
	R1	R2	R3
Protein	16,53	16,04	15,47
Fat	5,06	5,28	5
Crude Fiber	10,6	10,51	11,2
Metabolic Energy	3118,40	3182,40	3228,00
Ash	6,11	6,63	6,37
Calcium	0,90	0,93	0,92
Phosphorus	0,47	0,50	0,41

Note : *) Results of analysis at the Balitnak Laboratory, Bogor (2024)

The data for this study were obtained from data on dry matter consumption (dm), organic matter consumption (om), protein consumption, fecal dry matter content, fecal organic matter, and fecal protein. Variables measured in this study

1. Consumption of Dry Ration Matter (DRM):

$$\text{Consumption of DRM} = \frac{\text{DRM feed}}{100}\ x\ \text{Consumption of Feed}$$

2. Digestibility of Dry Matter

$$Digestibility\ of\ Dry\ Matter(\%) = \frac{feed\ of\ Dry\ Matter - \ Dry\ \ Matter\ Excreta}{Feed\ of\ dry\ matter} x\ 100$$

3. Consume of Organic Matter (MO)

$$\text{Consume of MO} = \frac{feed\ of\ MO}{100}\ x\ Feed\ comsuption$$

4. Digestibility of Organic Matter

$$Digestibility\ of\ Organic\ Matter(\%) = \frac{feed\ of\ Organic\ Matter - Organic\ \ Matter\ Excreta}{Feed\ of\ organic\ matter} x\ 100$$

5. Digestibility of Protein

$$Digestibility\ of\ Protein\ (\%) = \frac{feed\ of\ Protein\ -\ Protein\ \ Excreta}{Feed\ of\ Protein} x\ 100$$

Data analysis used a Completely Randomized Design (CRD) with 3 treatments and 6 replications. (Steel and Toriie, 1991)

RESULTS AND DISCUSSION

The average amount of dry matter consumption, organic matter consumption, dry matter and organic matter digestibility and protein digestibility of rations using indigofera flour in KUB chickens are presented in Table 3.

Table 3. Average of Dry Matter Consumption, Organic Matter, Dry Matter and Organic Matter Digestibility and Protein of KUB Chicken Pellet Rations.

Parameter	Treatment		
	R1	R2	R3
Dry Matter Consumption (g)	91,72 ± 0,49	91,54 ± 0,06	91,32 ± 027
Organic Matter Consumption (g)	77,63 ± 0,42	77,97 ± 0,31	76,52 ± 0,39
Dry Matter Digestibility (%)	81,33 ± 0,43	81,56 ± 0,84	80,88 ± 0,72
Organic Matter Digestibility (%)	80,06 ± 0,78	79,06 ± 1,54	79,22 ± 1,58
Protein Digestibility (%)	75,66 ± 0,63	74,94 ± 0,68	73,41 ± 0,63

Descrip: The treatment did not provide any significant difference in effect (P>0.05)

Effect of Treatment on Dry Matter Consumption of Rations

Dry matter consumption is measured by the amount of feed consumed multiplied by the dry matter of the ration. The data in Table 3 above shows that the average dry matter consumption of KUB chicken rations is between 91.32 g and 91.72 g. The results of the analysis of variance show that the effect of different treatments is not significant (P > 0.05) on dry matter consumption of rations.

This means that the use of indigofera flour in rations at replacement levels of 0, 5, 10% as a component of KUB chicken rations does not cause a significant difference in dry matter consumption of rations. This is because the nutrient content of the treatment ration is almost the same and is within the limits of KUB chicken livestock needs so that the dry matter content of the treatment follows the nutrient content of the ration. The amount of feed consumed by a livestock is influenced by palatability, digestibility and nutrient composition in the feed (Anggorodi, 1994).

Effect of Treatment on Consumption of Organic Matter in Rations

Organic matter consumption is measured by the amount of feed consumed multiplied by the organic matter in the ration. The data in Table 3 above shows that the average consumption of organic matter in KUB chicken rations is between 76.52 g and 77.97 g.

The results of the analysis of diversity show that there is no significant effect (P> 0.05) on the consumption of organic matter in the ration. This result is in line with the digestibility of organic matter which also has no significant effect. This is because organic matter is part (component) of dry matter. According to Anggorodi (1995), most of the dry matter components consist of organic matter. In addition, the ash content of the ration consumed is in almost the same range. According to Purwadaria et al (1997) who stated that ash does not change absolutely, then if there is an increase in ash content, it indicates a decrease in organic matter in the substrate. In this study, the ash content value was in almost the same range in each treatment so that the organic matter consumed was not different.

Effect of Treatment on Dry Matter Digestion of Rations.

Dry matter digestibility is measured to determine the amount of nutrients absorbed by the body which is done through analysis of the amount of dry matter, both in rations and in feces. According to Ranjhan, (1980). dry matter digestibility is the difference between the amount of dry matter consumed and the amount excreted. Dry matter digestibility is measured based on calculating the amount of dry matter consumption, minus the amount of dry matter excreta, then divided by dry matter consumption and multiplied by 100%.

The data in Table 3 shows that the average dry matter digestibility of broiler chicken rations is between 80.88 and 81.56%. The results of the analysis of diversity indicate that the effect of different treatments is not significant (P> 0.05) on the dry matter digestibility of rations. This means that the use of indigofera flour in the ration at replacement levels of 0, 5, 10, 15, and 20% as a partial substitute for corn in broiler chicken rations does not cause significant differences in the digestibility of dry matter in the ration. This is thought to be because the composition of the ration nutrients, especially the amount of dry matter in the treatment, is the same. The high and low content of dry matter digested is related to the amount of nutrient content absorbed.

Tillman, et al (1998) stated that dry matter excreted in excreta is a nutrient that is not absorbed by the body. Blair, et al (1990) cited by Rambet et al. (2016) that the digestibility of dry matter in the finisher phase broiler ration ranges from 50–80%.

According to Maynard, et al (1979), digestibility is influenced by the content of nutrients in the ration and the amount of ration consumed. Effect of Treatment on Digestibility of Organic Matter in Rations. Measurement of digestibility value is basically an effort to determine the amount of nutrients that can be absorbed by the digestive tract.

The digestibility value is measured by calculating the amount of feed consumed and the amount of excreta defecated. The data in Table 4 shows that the average digestibility of organic matter in KUB chicken rations is between 79.22% and 80.06%. The results of the study of the digestibility value of organic matter in rations using pumpkin waste conducted by Moningkey, et al (2019) ranged from 79.39 - 83.56% but this comparison was in broiler chickens.

The results of the analysis of diversity showed that the effect of different treatments was not significant (P> 0.05) on the digestibility of organic matter in rations. This means that the use of indigofera flour in rations at replacement levels of 0, 5, 10% as a composition of KUB chicken pellet rations does not cause significant differences in the digestibility of organic matter in rations.

The digestibility of organic matter does not have a significant effect in line with the digestibility of dry matter which also does not have a significant effect. This is because organic matter is a component of dry matter. According to Anggorodi (1979), most of the dry matter components consist of organic matter. The digestibility of organic matter is influenced by the digestibility of the organic matter components, namely protein, carbohydrates (BETN and crude fiber) and fat. In order to achieve optimal digestibility of

organic matter, the nutrient value of the organic matter components must be adjusted to the needs of the livestock itself.

Effect of Treatment on Protein Digestion of Rations.

The data in Table 3 shows that the average digestibility of organic matter in KUB chicken rations is between 73.41% and 75.66%. The results of the analysis of diversity show that the effect of different treatments is not significant (P > 0.05) on the digestibility of organic matter in rations. This means that the use of indigofera flour in rations at usage levels of 0, 5, and 10% in the composition of KUB chickens does not cause a significant difference in the digestibility of protein in rations.

Protein digestibility does not have a significant effect in line with dry matter digestibility which also does not have a significant effect. This is because protein is part of organic matter and organic matter is a component of dry matter.

According to Anggorodi (1979), most of the dry matter components consist of organic matter. The digestibility of organic matter is influenced by the digestibility of organic matter components, namely protein, carbohydrates (BETN and crude fiber) and fat. In order to achieve optimal protein digestibility, the nutrient value of the organic material components must be adjusted to the needs of the livestock itself. Mangisah, et al (2006) stated that the nutrient content is in the range of KUB chicken needs.

CONCLUSION

Based on the results obtained, it can be concluded that indigofera flour (Indigofera sp) used up to 10% in KUB chicken pellet rations based on the digestibility value of dry matter, organic matter and protein

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