INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN MULTIDISCIPLINARY EDUCATION

ISSN(print): 2833-4515, ISSN(online): 2833-4531

Volume 03 Issue 10 October 2024

DOI: 10.58806/ijirme.2024.v3i10n14, Impact factor- 5.138

Page No. 1690 - 1694

Effect Use Noni (Morinda Citrifolia) Leaf Meal with Different Levels in Basal Diet on Performance and IOFC of Landrace Crossbed Pig

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ABSTRACT: This study was conducted with the aim of determining the effect of the use of noni leaf meal on diet intake, weight gain, feed conversion and income overfeed cost (IOFC) of landrace crossbed pig. Material used is landrace crossbed pig 12 starter phase aged 1-2 months with a weight variation of 10.50-21.50kg (average 16.70kg) and the variation coefficient is 18.76%. Lasts for 8 weeks consisting of 2 weeks of adjustment period and 6 weeks of data collection period. The method used in this study is a direct experimental method using a Randomized Group Design consisting of 4 treatments and 3 tests so the number of samples taken is 12 samples. The treatment used is R0: 100% basal diet without noni leaf meal; R1: 98% basal diet+2% noni leaf meal; R2: 96% basal diet+4% noni leaf meal and R3: 94% basal diet + 6% noni leaf meal. The variables studied were diet intake, body weight gain, diet conversion and IOFC. The results of fingerprint analysis using Microsoft Excel showed an unreal effect treatment (P>0.05) on the research variables. The conclusion of this study is that the use of noni leaf meal in basal diet of 2, 4 and 6% has a relatively similar effect on diet intake, body weight gain, diet conversion and IOFC of landrace crossbed pig in the starter phase.

KEYWORD: Pigs, Noni, Feed Additive

INTRODUCTION

Farmers usually use commercial feed, have high nutrition and are also equipped with antibiotics that can launch and kill parasites in the digestive system of livestock. However, this commercial feed uses chemical antibiotics, this can have an impact on humans. The use of chemical antibiotics as feed ingredients increases the chances of residues in the results of research center farms (Etikaningrum and Iwantoro, 2017). Therefore, the government prohibits the use of feed additives as stated in article 16 of permentan No. 14/2017.

One of the natural alternatives that need to be used to replace the antibiotic function of feed additives is to use Morinda citrifolia. This is because the leaves contain xeronine and proxeronine compounds as antibiotics, and also contain antibacterial compounds such as anthraquinones and alkaloids that can inhibit the growth of pathogenic bacteria such as Salmonella sp and Shigella (Sudewi and Lolo 2016). The increasing efficiency of nutisi absorption in pigs will be more nutrients that can be utilized by the pig body for the production process. The existence of several biologically active compounds contained in the leaves is expected to have an impact on pig livestock, especially for the performance and Income overfeed cost (IOFC) of landrace crossbed pig.

MATERIALS AND METHODS

Place of Research

The place of this study is in Neka Tuka Hamlet, in East Baumata Village, Taebenu District, Kupang Regency.

Research Materials

The material used was 12 heads of castrated male of landrace crossbed pig aged 1-2 months and weighing between 10-20 kg. The cages used in this study were individual zinc-roofed, floored and cement-walled cages of 12 plots, each plot measuring 2m x 1.8m and a 2o floor slope and equipped with separate feed and water containers.

Equipment

The tools used in this study consisted of a Morizt Goatz brand hanging scale with a capacity of 100 kg with the smallest scale of 0.5 kg to weigh pig livestock, a Lion Star brand sitting scale with a capacity of 15 kg with the smallest scale of 0.05 kg to weigh

feed ingredients and feces, a bucket to take drinking water, a sack to weigh diets and feces, a shovel to lift feces during drying under the sun, broomsticks for cleaning cages and cameras for taking pictures.

Research Feed

Feed ingredients used in this study were rice bran, corn flour, concentrate KGP-709, mineral-10 and coconut oil. The feed ingredients and nutritional content are shown in table 1, while the composition and nutritional content of the basal diet are found in table 2.

Table 1. Nutritional Content of Feed Ingredients

Feed ingredients	Nutritional Content						
	DM (%)	EM (kkal/kg)	CP (%)	CF (%)	CFi (%)	CHO (%)	BETN (%)
Cornstarch [a)]	85.31	2,951.34	7.68	1.42	2.46	74.64	72.17
Rice bran [a)]	91.03	2,478.89	8.91	9.85	18.96	59.73	53.66
Consentrate KGP-709[b)]	88	2,700	38	3	8	71.50	67.50
Mineral-10[C)]	-	-	-	-	-		
Coconut Oil[d)]	-	8,600	-	90	-		
Noni Leaf Meal[e)]	87.10	4,382	9.02	8.65	24.99	Not analyzed	Not analyzed

Description:

[a)] Dalle et al., (2022);

[b)] Information on the packaging label;

[c)] Mineral content of Ca= 43%, P= 10%, Fe 4.40%, Mg = 3.30%, Mn = 0.40%, Zn = 0.50%, Cu = 0.05%;

[d)] Information on the packaging label;

[e)] The results of the proximate analysis at the Soil Chemistry Laboratory, Faculty of Agriculture, Nusa Cendana University Kupang (2018).

Table. 2 Composition and Nutritional Content of Basal Diet *)

Feed ingredients	Nutritional Content							
	Composition	DM (%)	EM (kkal/kg)	CP (%)	CF (%)	CFi (%)	CHO (%)	BETN (%)
Cornstarch	42	35.83	1,239.56	3.23	0.60	1.03	31.35	30.31
Rice bran	20	18.21	495.78	1.78	1.97	3.79	11.95	10.73
Consentrate KGP-709	37	32.56	999	14.06	1.11	2.96	26.46	24.98
Mineral-10	0.5							
Coconut Oil[)]	0.5		43.00		0.45			
Sum	100	86.60	2,777.34	19.07	4.13	7.79	69.75	66.02

Description: *) The content of nutrients is calculated on the basis of table 1.

Research Methods

This study used a direct experimental method on male landrace breeding pigs of starter phase castdiet. The research design used was a Randomized Group Design consisting of 4 treatments and 3 tests so that there were 12 experimental units. The treatment of research basal diet is:

R_0: Basal Diet + 0% Noni Leaf Meal

R_1: 98% Basal Diet + Noni Leaf Meal 2%

R_2: 96% Basal Diet + Noni Leaf Meal 4%

R_3 : 94% Basal Diet + Noni Leaf Meal 6%

Variables studied

Diet Intake

Diet intake is obtained from the amount of diets given minus the remaining diets for one day.

Daily Body Weight Gain

Daily Body Weight Gain (DBWG) obtained from the final body weight minus the initial body weight divided by the length of maintenance time by the formula:

$$\text{DBWG} = \frac{\textbf{Final weight (kg)} - \textbf{initial weight(kg)}}{\textbf{Maintenance time (days)}}$$

Diet Conversion

Diet conversion (DC) is obtained from the large number of diets consumed divided by the increase in body weight of livestock.

$$\text{DC} = \sum \frac{\textbf{Amount of feed consumed}}{\text{DBWG}}$$

Income Overfeed Cost (IOFC)

Income Overfeeding Cost (IOFC) is the total income calculated by subtracting the total diet costs or IOFC incurred during the study period, which is the difference between income and diet feeding costs per number of livestock (Ariana et al., 2014) or can be calculated by:

IOFC = TP – KR

Description:

IOFC = Income Over Feed Cost (Rp/ekor)

TP = Total receipts from the sale of live pigs (Rp/head)

KR = Cost for diets consumed by livestock (Rp/head)

Data Methods and Analysis

The design used in this study was a Group Randomized Design assuming it was difficult to get livestock with uniform body weight. Therefore, the data analysis used is according to the Analysis Of Varience (ANOVA) model to determine the effect of treatment, and the Duncan multiple distance test to test the difference between treatment averages.

RESULTS AND DISCUSSION

Effect of Treatment on Pig Performance Research

Based on the results of the study, the addition of noni leaf meal to the basal diet decreased in R1 when compared to the control diet (R0) but increased in R2 and the diet with the best treatment was R3. The results of the study can be seen in the table. The results of the study can be seen in table 3.

Table 3. Average Treatment of Research Livestock Performance.

Variable	Treatment				P-Value
	R0	R1	R2	R3	
Diet Intake (gram/head/day)	4,127.78 ± 507.60	4,016.67 ± 390.29	4,252.78 ± 76.19	4,363.89 ± 193.93	0.91
Daily Body Weight Gain (gram/ head/day)	472.79 ± 142.98	445.58 ± 158.52	527.21 ± 35.84	544.22 ± 77.93	0.37
Diet Conversion	2.95 ± 0.43	3.09 ± 0.52	3.14 ± 0.74	2.53 ± 0.12	0.58

Description: ^{tn} Absence of superscript at the mean value indicates no markedly different treatment (P>0.05).

Intake Diet

Based on the data in table 4, it can be seen that the use of leaf flour up to the level of 6% in the basal diet shows an unreal effect treatment (P>0.05) on diet intake. In the treatment R1 experienced a decrease in diet intake compared to R0, this is thought to be caused by a bitter taste and a distinctive aroma that makes diet intake decrease. Diet intake in R2 and R3 has increased due to the smooth digestive system of pig livestock because the leaves contain anthalmentic compounds that function to kill worms in poultry and pigs (Suarjana et al., 2018). This is in line with the opinion of Farida et al. (2017) who state that there is a close

relationship between digestibility and the digestive process in the gastrointestinal tract where the higher the digestibility of a food ingredient in the digestive apparatus, the more space is available for the addition of feed ingredients.

According to Nurhayati (2008) also states that in the leaves of noni there are anthraquinone compounds that function to increase appetite. Amrianto et al. (2017) state that the characteristic aroma of the leaves and the slightly bitter taste are assumed to have been reduced by drying and making in the form of flour. The processing of holiness leaves in the form of flour in addition to reducing the particle size to make them easier to digest by pigs, is also thought to be a supporting factor in reducing the unpleasant aroma of the leaves.

Daily Body Weight Gain

Measurement of body weight gain of pig livestock research was carried out for one time in 1 week, data collection or weighing of pigs was not carried out too often so that pig livestock were not stressed due to weighing so as not to result in a decrease in diet intake. Based on table 4, it can be seen that the addition of leaf flour in the basal diet of up to 6% to the weight gain of livestock research shows an unreal influence (P>0.05). The effect of body weight gain in this study is in line with diet intake where there is a decrease in R1 but an increase in R2 and R3. This shows that body weight gain and diet intake are closely related.

The increase in body weight gain in R2 and R3 is caused by an increase in the level of giving leaf flour containing anthalmentic compounds that function to kill worms in the digestive tract of pigs and poultry (Suarjana et al., 2018). The killing of worms in the digestive tract makes the absorption of nutrients in the diet by the digestive tract of pigs better, resulting in an increase in body weight gain in pig livestock research.

According to Halimah (2019) the leaves contain protein, lime, iron, ascarbonine, carotene and have antimicrobial, antifungal, anti-protozoan, antioxidant, antidiabetic, antidiarrheal, antihypertensive and accelerate wound healing activities. This content makes the addition of holiness leaf flour in the diet have a positive effect on livestock so that the more the addition of holiness leaf flour, the average body weight encroachment in research livestock also increases.

Diet Conversion

The results of the variance analysis (table 3) showed that the addition of leaf flour in the basal diet to the diet coversion had no real effect (P>0.05). This means that the addition of leaf flour in the basal diet to 6% gives relatively the same results as the control diet. The effect of conversion in this study is in line with diet intake and also body weight gain where there is a decrease in R1 but an increase in R2 and R3. This shows that weight gain and diet intake are closely related.

The best conversion value is in R3 this happens because leaf flour can increase the absorption of food substances by slowing intestinal peristalsis and reducing pathogenic bacteria and in the digestive tract (Surjana et al., 2018). Noni leaves contain steroid compounds and tripenoids that function as antibacterials for the livestock body (Hudaya et al., 2013). This antibacterial compound causes the conversion value of diets to be better. This best conversion value shows that diets with the addition of leaf flour as feed additives have a positive influence on pig livestock..

Income Overfeed Cost (IOFC)

Table 5. Average Treatment of IOFC Livestock Research.

Treatment	Final Body Weight (Kg/head)	Income (Rp/head)*	Diet price (Rp/kg)	Feed Cost (Rp/head)**	IOFC (Rp/head)
R0	41.50	3,527,500	6,265	482,729.85	3,044,770.15
R1	39.33	3,343,333.33	6,365	477,233.56	2,866,099.78
R2	44.83	3,810,833.33	6,465	513,225.22	3,297,608.11
R3	45	3,825,000	6,565	534,780.04	3,290,219.96

Description:The absence of superscripts at mean values indicates that the treatment does not differ markedly (P>0.05).

* Final body weight (kg) x sale price/kg (85,000/kg)

** Body weight gain (kg) x diet price (Rp/kg)

Based on fingerprint analysis, the effect of treatment had no real effect (P>0.05) on the IOFC of pig livestock research. This means that the use of leaf flour produces relatively similar results to the control diet (R0). Based on the calculation results, it can be seen that the best use of feed is found in the R2 treatment which is slightly compared to the R3 treatment. The calculation of IOFC in the R3 treatment is the addition of leaf flour up to the level of 6% in the basal diet of 3,290,219.00 Rp/head while in the control diet (R0) it is 3,044,770.15 Rp/head. This is due to the final BB of pig livestock the most important research found in R3, in line with Satriawan et al., (2021) stated that IOFC is strongly influenced by diet intake, final weight, diet price and selling price of livestock.

Sihombing (2006) suggests that one of the factors influencing the economic value of pig production is the cost of feed as an input and the amount of growth as an output. Kambe et al., (2019) show that every pig business should consider the input of minimum feed costs to achieve maximum profit.

CONCLUSION

The conclusion of this study is that the use of leaf flour in basal diets of 2, 4 and 6% has a relatively similar effect on diet intake, body weight gain, diet conversion and IOFC of peranakan landrace pig livestock in the starter phase.

REFERENCE

1) Amrianto, Mukarramah, Dike D S, Nurun N A, Andi D P. 2017. Formulasi Ekstrak Buah Mengkudu (Morinda citrifolia) dalam Bentuk Sediaan Transdermal Liposome Cream. Prosiding Seminar Nasional Biology for Life 2017: 19-25.
2) Ariana IN.T., AA. Oka, IG. Suranjaya dan NLP. Sriyani. 2014. Penampilan Sapi Bali yang Dipelihara di Tempat Pembuangan Akhir (TPA) Pesanggaran, Denpasar-Bali. Prosiding. Seminar Nasional Sains & Teknologi 2014. Kuta Bali. LPPM Universitas Udayana. 18-19 November 2014. Hlm. 635-640.
3) Badan Standarisasi Nasional Indonesia [BSNI]. 2006. Pakan Anak Babi Sapihan (Pig Starter) SNI 01-3912-2006. Jakarta (ID): Badan Standarisasi Nasional Indonesia.
4) Dalle N. S., S. Sembiring., E. J. L. Lazarus. Effect of Including Fermented Feather Meal as Substitution of Concentrate in the Basal Diet with Different Levels on the Performance ofLandrace Crossbred Pigs. Jurnal Sain Peternakan Indonesia 17 (1): 44-50.
5) Etikaningrum dan S. Iwantoro. 2017. Kajian Residu pada Produk Ternak Unggas di Indonesia. Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan. 05 (1): 29-33
6) Farida, W. R., Sari, A. P., dan Nugroho, H. A., 2017. Analisis Kebutuhan Nutrien dan Efisiensi Penggunaan Pakan Bubur Formulasi pada Oposum Layang (Petaurus breviceps waterhouse, 1839). Jurnal Biologi Indonesia 13(2): 305-314.
7) Haliman H., Suci D M.,Wijayanti I. 2019. Studi Potensi Penggunaan Daun Mengkudu (Morinda Citrifolia L.) Sebagai Bahan Antibakteria Es hercia coli dan Salmonella tryphimurium. Jurnal Ilmu Petrnanian Indonesia (JIPI) 24 (1): 58-64.
8) Hudaya T, Prasetyo S, Kristijarti AP. 2013. Ekstraksi, isolasi, dan uji keaktifan senyawa aktif buah mahkota dewa (Phaleria macrocarpa) sebagai pengawet makanan alami. Lembaga Penelitian dan Pengabdian kepada Masyarakat. Parahyangan (ID): Universitas Katolik Parahyangan.
9) Kambe, H.K., Dodu, T., Aryanta, I M S. 2020. Efek penggunaan larutan daun kelor (Moringa oleifera lam) dalam "liquid feeding" terhadap performan dan income over feed cost babi peranakan landrace fase starter-grower. Jurnal Peternakan Lahan Kering 2 (2):790-798.
10) Murdiati, T. B., Adiwinatai G. dan Hildasari D. 2000. Penelusuran Senyawa Aktif dari Buah Mengkudu (Morinda citrifolia) dengan Aktivitas Antelmintik terhadap Haemoncus Contortus. Jurnal Ilmu Ternak dan Veteriner 5 (4): 255-259.
11) Sarida, M., Tarsim., dan Faizal, I. 2010. Pengaruh Ekstrak Buah Mengkudu (Morinda Citrifolia L.) dalam Menghambat Pertumbuhan Bakteri Vibrio harveyi Secara In vitro. Jurnal Penelitian Sains. 13 (3): 59-63.
12) Satriawan, Tri U., Herly E. 2021. Penambahan Tepung Kulit Buah Semangka (Citrullus Lanatus) Pada Reduced Fat Mayonnaise Ditinjau Dari Kestabilan Emulsi, Protein, Mikroorganisme Dan Ffa. Sarjana thesis. Universitas Brawijaya.
13) Sihombing, D. T. H. 2006. Ilmu Ternak Babi. Cetakan ke- 2. Gadjah Mada University Press, Yogyakarta.
14) Suarjana, I P., N W Siti., I G N G Bidura. 2018. Pengaruh pemberian ekstrak air daun mnegkudu (Morinda citrifolia) melalui air minum terhadap kualitas fisik telur ayam lohmann brown umur 22-30 minggu. Peternakan tropika 6 (1): 129-139.
15) Sudewi, S. dan Lolo, W. A. 2016. Kombinasi Ekstrak Buah Mengkudu (Morinda citrifolia L.) dan Daun Sirsak (Annona muricata L.) dalam Menghambat Bakteri Escherichia coli dan Staphylococcus aureus. Jurnal Ilmiah Farmasi 4(2), 36-42.