

Conference Paper

Effects of Palm Kernel Meal in Diets of Layer KUB Chicken

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Abstract.

The purpose of this study was to investigate the effects of different levels of palm kernel meal (PKM) on diets of layer KUB (Kampung Unggul Balibangtan) chicken. Local feed was included in the various diets of PKM at levels of 0% (T1), 10% of PKM (T2) and 20% of PKM (T3). This research was conducted in 2019 at the beginning of layer period. One hundred and forty-four 22-week-old layer birds were selected from a flock and randomly allocated to three treatments with 3 replicates of the diet feeds introduced. Feed intake and egg production were determined using the SPSS Software. The increase in PKM levels had no effect on feed intake and egg production ($p>0.05$). The egg production in each treatment were 65.39%, 60.67 % and 62.50%. PKM applied in T3 (20%) did not affect the egg production in KUB chickens due to low crude fibre (4.64%). The price of feed in T1, T2 and T3 were IDR 6,000, IDR 5,250 and IDR 4,500 respectively. With the difference in PKM feed prices of IDR 1,500 compared to commercial feed, this is expected to reduce the cost of KUB chicken production.

Keywords: Palm kernel meal (PKM), layer KUB chicken, production

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1. Introduction

Feed accounts for about 70% of the total cost of livestock production [1]. To meet the demand for food from livestock such as eggs, production costs should be reduced to a minimum. Competition between humans and livestock for conventional feedstuffs has led to scarcity and increase the feed ingredient prices [2]. To maintain productivity at a low cost production, it is very important to include more alternative feed ingredients that inexpensive and readily available. Oil palm has an important role in the Indonesian economy an area of 14 million hectares and 8.2 million workers. As many as 40% of them are smallholder plantations, the rest are company-owned plantations. Indonesia is the largest palm oil producer in the world, along with Malaysia which is currently controls about 85% of world palm oil production [3]. Palm kernel meal (PKM) is a feed ingredient that can be used for animal feed [4–6]. It contained 14-21% of crude protein and energy of 4.998 Kcal/ kg [7]. The quality improvement of PKM has also been informed in many

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literatures such as fermentation technology and the addition of enzymes [6,8,9]. PKM feeding by 40% results in egg production by 70% in laying hens [4]. However, giving PKM to broilers is recommended only 10% due to the high crude fiber content [10]. Crude fiber allowed for a maximum of 5% poultry feed [11]. Utilization of PKM on laying hens produce good results on egg production [5,12] however the study on KUB chickens during the production period still limited. For this reason, this study was carried out to determine the effect of PKM feeding at different levels on KUB chickens in layer period.

2. Materials and Methods

The assessment was carried out at the Papringan rental pen in Semarang Regency from October to November 2019. This study was used 171 KUB chickens which were divided into 3 treatments and 3 replications. Each treatment consisted of 3 male and 16 female birds with a total of 19 chickens. Six months age of extensive laying period was used in this assessment. Every replicate used flock size of 2x4m². The feeding treatment of KUB layer chicken is explained below:

T1: 100% commercial feed/ 0 % of PKM

T2: 50% commercial feed; 50% of PKM feed/ 10% of PKM

T3: The first week (W1): 25%: 75% (PKM diet: commercial feed); W2: 50%: 50%; W3: 75%: 25%; W4-W7/ 20% of PKM

Diet rations were given twice a day with the number of rations in weeks and *ad libitum*. Drinking water was also given by *ad libitum*. Parameters observed in this study were the identification of PKM diet content, percentage and average of egg production. All data collected were statistically analyzed using the analysis of variance for Completely Randomized Design according to the statistical methods outlined in [13]. Data were subjected to statistical analysis using SPSS Statistical Package. Significant differences among treatments were assessed by Duncan's New Multiple Range Test (DNMRT) at significance level of 0.05.

3. Results and Discussion

Palm kernel meal (PKM) is a suitable feed ingredient used for animal feed [4–6]. This product contains high crude protein, reaches up 18-24% and Metabolites energy varies between 2920,51-3187,45 Kcal/ kg [14]. In this study, the crude protein content assessed in PKM is 18.05% (Table 1). This result is in accordance with the needs of KUB laying chickens which requires 16% of protein [15]. According to result from laboratory feed

analysis, CP content of PKM is 13.58%, whereas soluble fiber, starch and sugar concentrations are low [16]. KUB Chickens are native chicken of female line selection for six generation [15]. KUB chicken possessed high egg production (66.67%), better and faster growth, low mortality, excellent hatchability and low feed consumption [15].

TABLE 1: Composition of feed and nutritional content of Layer KUB chickens.

Descriptions	T1	T2	T3
Feedstuffs (%)			
Commercial feed	100	50	0
Palm kernel meal	0	10	20
Kongbap Rice	0	27.5	55
Concentrate reject	0	7	14
CP concentrate	0	5	10
Enzyme Natuzyme	0	0.0018	0.004
Top mix	0	0.5	1
Nutrition Content			
Dry matter (%)	88.00	89.91	91.82
Ash (%)	11.00	11.06	11.13
Crude Protein (%)	19.00	18.52	18.05
Crude Fat (%)	5.00	4.13	3.27
Crude Fiber (%)	7.00	5.82	4.64

Dry matter intake of birds ranged between 85.43-90.54 g (Table 2). Hens consumed 80 g of feed per day and need dietary lysine 0.69 g per day. High daily feed consumption requires low nutrient concentration. On the contrary, low daily feed intake does require high nutrient concentrations [17]. Dry matter intake of application 20% PKM is higher while protein intake was not significant due to similar ash content in the feed (Table 1). Minimum ash content of feed poultry by product meal is 12.8% [18]. It is interesting to note that in second weeks of experiment of T2 and T3, DMI of T3 was lower than T2 (with similar feed). It is presumably due to adaptation of birds in first week of 10% PKM in the beginning of experiment.

The average of KUB chicken egg production from each treatment (16 females) resulted in the average production in T1 VS T2 VS T3, respectively 65,39% VS 60,67% VS 62,50% (Figure 1). This figure shows the trend of increasing egg production from the first week to the seventh week linearly both at T1, T2 and T3. Egg production in all treatments were found to be higher compared to other results (15-30% of PKM in local laying hens resulted in 56-58% of egg production) [5]).

The PKM content in T3 of 20% did not affect egg production in KUB chickens. It might be due to lower crude fiber (4.64%) (Table 1 and 3). High fiber diets would successfully

TABLE 2: Dry Matter Intake and Crude Protein Intake of experimental diets.

Items	T1	T2	T3	SEM	p-value
Total Dry Matter Intake (g)	85,43 ^b	89,70 ^a	90,54 ^a	0,83	0,001
22 weeks (W1)	74,32 ^c	79,09 ^b	86,98 ^a	1,90	< 0,001
23 weeks (W2)	68,37	70,98	67,60	0,73	0,137
24 weeks (W3)	79,40 ^b	88,78 ^a	84,90 ^{ab}	1,56	0,015
25 weeks (W4)	92,05	94,65	94,54	0,69	0,245
26 weeks (W5)	94,33 ^c	97,34 ^b	100,39 ^a	0,89	< 0,001
27 weeks (W6)	94,75 ^b	98,98 ^a	99,66 ^a	0,91	0,025
28 weeks (W7)	94,79 ^c	98,07 ^b	100,11 ^a	0,79	< 0,001
Crude Protein intake (g)	18,44	18,47	18,12	0,08	0,136
22 weeks (W1)	16,05 ^b	16,29 ^b	17,50 ^a	0,24	0,005
23 weeks (W2)	14,76	14,62	13,92	0,17	0,076
24 weeks (W3)	17,14	17,82	18,26	0,23	0,124
25 weeks (W4)	19,87 ^a	19,49 ^a	18,58 ^b	0,22	0,019
26 weeks (W5)	20,36 ^a	20,05 ^b	19,73 ^c	0,09	0,003
27 weeks (W6)	20,45 ^a	20,38 ^a	19,59 ^b	0,17	0,049
28 weeks (W7)	20,46 ^a	20,19 ^b	19,68 ^c	0,12	0,001

Means in the same row with different lowercase superscripts are significantly different (P<0.05).

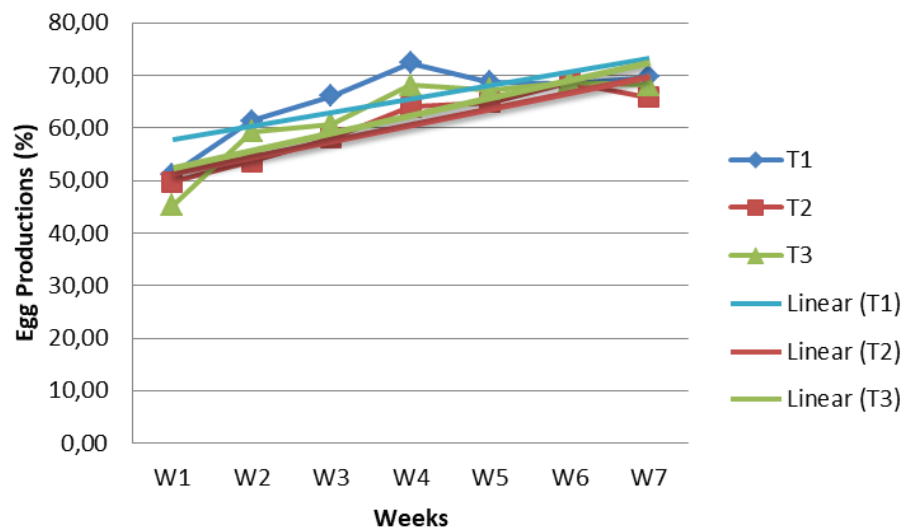


Figure 1: Egg productions of Layer KUB Chicken.

limit the Metabolic Energy (ME) intake [17]. ME of KUB Chicken is about 2.800 Kcal [15]. Dietary energy content must thus be specified to maintain the proper ratio of protein to energy, enables birds to consume an adequate amount of protein to obtain optimum performance [19]. The feed prices for T1, T2 and T3 were IDR 6,000, IDR 5,250 and IDR

4,500 respectively. With the difference in the price of PKM feed of IDR. 1,500, - from commercial feed is expected to reduce the production cost of KUB layer chicken.

TABLE 3: The differences in egg production in each feed treatment.

The average KUB chicken egg production	T1	T2	T3	p-value
22 weeks (W1) (eggs)	57,33	55,66	50,66	0,530
23 weeks (W2) (eggs)	68,66	60,00	66,33	0,640
24 weeks (W3) (eggs)	74,00	65,00	68,00	0,212
25 weeks (W4) (eggs)	81,00	71,66	76,33	0,495
26 weeks (W5) (eggs)	77,00	72,66	75,33	0,714
27 weeks (W6) (eggs)	76,66	77,00	77,00	0,998
28 weeks (W7) (eggs)	78,00	73,66	76,33	0,714

4. Conclusion

The laying feed formulation made from palm kernel meal (PKM) 20% had an average egg production of 62.50% and was effective in reducing feed production costs by 25%.

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