

## The Effect of Turmeric Flour in Combination with Various Levels of Peanut Flour on the Production Performance of KUB Hens

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### ABSTRACT

The study has purpose for knowing e the effect of giving a mixture of turmeric flour with various levels of peanut flour on the production performance of KUB hens. This research aimed to study used 60 hens were randomly divided into 4 groups: I, II, III and IV, 15 hens in each group with five replications were. Group T0: control, T1:0.15% turmeric flour (TF) and 5% peanut flour (PF), T2: 0.15% TF and 10% PF, T3: 0.15% TF and 15% PF. All hens were collection are feed consumption, body weight gain and feed conversion. Data for all groups were expressed as mean  $\pm$  standard deviation. Statistical analyses were performed using one-way analysis of variance (ANOVA) and Duncan's New Multiple Range Test (DMRT). Differences were considered to be statistically significant when ( $P < 0,05$ ). All statistical analyses were performed with SPSS software version 23. On the basis of the results concluded that combination of turmeric flour and peanut flour reported the significant effect on PBB and feed conversion ratio ( $P < 0,05$ ). Similarly, another result reported non - significant effect of combination of turmeric flour and peanut flour on feed consumption in hens ( $P > 0,05$ ). At the end of the experiment, on the basis of the performance of hens in respect to feed consumption, body weight gain and feed conversion, it is observed that combination of Turmeric Flour and 15% Peanut Flour concluded improves body weight and feed conversion ratio.

**Keywords:** KUB hens, tumenic flour, peanut flour, performance

### INTRODUCTION

Indonesia has a lot of poultry genetic resources that still need to be optimized, one of the reasons is because local chickens have genetic variation and high adaptive power. Various ways to improve the genetic quality of local chickens have been widely carried out, such as for kampung unggul balitnak chickens (KUB). Marsetyo, (2015) the growth of native chickens is relatively slower than that of purebred chickens where it takes 6 months to reach a body weight of 1 kg, whereas in broilers it only takes 1.5 months.

Livestock productivity can be increased by improving the quality of feed, namely, by adding natural feed additives and increasing protein levels. Feed additives that can be obtained from turmeric are curcumin 3-5% and volatile 2.5-6% (Hartati, 2013). Curcumin functions to increase the working power of the digestive organs of chickens by stimulating the gallbladder wall to secrete bile and pancreatic juice which contains amylase, lipase, and protease enzymes and functions to increase the digestion of carbohydrates, fats, and proteins. The essential oil in turmeric can also accelerate the emptying of gastric contents (Nurhayati et al., 2015).

Peanut is one type of legume that is widely cultivated in Indonesia and is a good source of nutrition for livestock.

Danuarsa (2006) reported the proximate test results of peanuts contain 23,97% protein, 45,15% fat, 4,57% water content, 2,07% ash content, and 2,35% crude fiber.

The results of the analysis of fatty acids in peanuts contain about 13,92% saturated fatty acids and unsaturated fatty acids: oleic 51.28% and linoleic 5,84%. Wati et al. (2018) protein and energy are needed for chicken growth, protein consumption for tissue growth and body maintenance, energy affects chicken body weight gain. Based on the description above, a study entitled "The Effect of Turmeric Flour in Combination with Various Levels of Peanut Flour on the Production Performance of KUB Hens".

### MATERIALS AND METHODS

This study used 60 KUB hens aged 10 weeks were used in this study, which were obtained from the PT Sumber Unggas from Bali. Hens are placed in individual cages with a size of 30x20x30Cm, equipped with feed and drinking water containers. Camry EK5055 brand analytical scales with a capacity of 1g to 5Kg are used to weigh feed.

This study used feed 105S laying hens produced by PT Gold Coin Indonesia as a basal ration with turmeric substitution and various levels of peanut flour given for 8 weeks as a treatment. Table 1 and the nutritional composition of the treatment feed are presented in Table 2

**TABLE 1:** The composition of the ration supplemented with turmeric flour and peanuts

Feed	Treatment			
	T0	T1	T2	T3
Basal feed	100%	94,85%	89,85%	84,85%
Turmeric flour	0%	0,15%	0,15%	0,15%
Peanut flour	0%	5%	10%	15%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**TABLE 2:** The composition of nutrients in the treatment feed

Treatment	Water* (%)	Ash* (%)	Fat* (%)	Protein* (%)	Carbohydrate by different* (%)	Fiber** (%)
T0	11.525	12.085	4.66	16.58	55.15	7
T1	11.995	11.56	6.39	17.02	53.035	6.7
T2	12.415	10.83	8.075	17.05	51.63	6.5
T3	11.705	10.415	9.57	17.08	51.22	6.3

\*) Testing in Laboratory PSPG UGM

\*\*) The calculation results: Silaen (2019) and Danuarsa (2006)

This study was designed using a completely randomized design based on the homogeneity of the age and sex of the chickens used, consisting of four treatments based on the level of peanut flour. Parameters observed included feed consumption (feed intake), body weight gain (PBB), and feed conversion ratio. Feed consumption (g/head) was obtained by calculating the difference between the amount of remaining ration and the total amount of ration given. Body weight gain (g/head) was obtained by calculating the difference between final hen body weight and initial body weight for 8 weeks, and ration conversion was calculated by dividing ration consumption by body weight gain achieved within a certain period of time. The data obtained were analyzed using an analysis of variation from a completely randomized design with a unidirectional pattern.

The difference in the mean of each treatment was tested using Duncan's New Multiple Range Test (DMRT) with the help of SPSS version 23.

## RESULT AND DISCUSSION

### Effect of Treatment on Feed Consumption

The average feed consumption of KUB hens with a combination of turmeric flour and various levels of peanut flour during the treatment can be seen in Table 3. The results of the analysis showed that the treatment did not affect ( $P>0.05$ ) feed consumption. The phytoestrogen content in turmeric flour and peanut flour, so that the volatile content in turmeric flour does not provide maximum results in feed consumption. The phytoestrogen content of turmeric is 6.73% (Saraswati et al., 2013) and peanuts is 173 $\mu$ g/100 g (Kuhnle et al., 2008).

**TABLE 3:** The effect of the combination of turmeric flour and peanut flour on the production performance of KUB hens

Parameter	Treatment			
	T0	T1	T2	T3
Feed intake per day (g)	65,11071 $\pm$ 6,7 <sup>a</sup>	70,19405 $\pm$ 9,4 <sup>a</sup>	68,575 $\pm$ 6,0 <sup>a</sup>	74,535 $\pm$ 66,14 <sup>a</sup>
PBB (g)	635,33 $\pm$ 144,13 <sup>a</sup>	755,86 $\pm$ 104,29 <sup>b</sup>	787,26 $\pm$ 137,82 <sup>b</sup>	803,86 $\pm$ 150,42 <sup>b</sup>
FCR	5,9 $\pm$ 1,12 <sup>a</sup>	5,2 $\pm$ 0,74 <sup>b</sup>	5,0 $\pm$ 0,92 <sup>b</sup>	4.6 $\pm$ 0,84 <sup>b</sup>

\*Different superscripts in the same column showed significant differences ( $P<0.05$ )

Fitriani (2018), estrogen acts through ERs (estrogen receptors) in the hypothalamus to reduce food consumption and mediate anorectic effects by decreasing the expression and secretion of NPY (neuropeptide Y). Estrogen deficiency can increase the amount of NPY so that it can increase appetite. The lowest consumption was observed at T0 which has the highest crude fiber (CF) value, which is known to consist of cellulose, hemicellulose, and lignine which most of the digestive tract of poultry cannot digest properly and are bulky or blocky. CF levels that are too high can cause nutrient digestion to take longer and the value of productive energy to be lower, besides that it causes reduced palatability so that consumption levels are low. Digestion of CF in poultry occurs in the cecum reaching 20-30% (Prawitasari et al. 2012) with the help of microorganisms because birds do not have cellulose enzymes that function in breaking down CF.

The results of research by Wati et al., (2018) with the addition of 7.5% calliandra flour tend to reduce feed consumption, this happens because the higher the level of calliandra flour given, the higher the CF content in the feed, with high CF will cause consumption decreased feed.

The content of 15% peanut flour in T3 showed a decreased level of consumption compared to treatments T1 and T2 this was due to the fat content with a higher percentage. Munisa et al. (2015) fat is one of the main nutrients in feed that is needed for growth, because fat has a high energy source value that can be used for daily activities. The energy content in the feed will affect feed intake, if the feed energy is too high it will cause fat accumulation so that you will feel full quickly and limit the amount of feed consumed (Qinghui, 2005).

Fats and oils are the largest and most important part of the lipid group, namely as the main food component for living organisms. Fats and oils contain essential fatty acids contained in them. body. The total oil content in feed will determine energy utilization so that efficient use of oil can increase protein efficiency for growth (Sutantyanto, 2011). Mardhotillah et al. (2020) increasing energy utilization in feed will cause a decrease in feed consumption, but does not have a negative effect on daily weight gain. The level of protein contained in T3 also showed the highest level compared to the other treatment groups. According to Sutardi, (2010) palatability is determined by the concentration of amino acids in blood plasma. Consumption of high protein quickly causes a feeling of fullness because it can increase the levels of amino acids in blood plasma, thereby increasing the feedback mechanism which ultimately reduces palatability. The highest consumption was observed in T1 this was possible because in T1 the CF content had decreased compared to T0 and the fat content in the feed was not too high compared to T2 and T3 so that it did not cause a feeling of fullness quickly.

### Effect of Treatment on Weight gain

The weight gain of KUB hens with a combination of turmeric flour and various levels of peanut flour for 8 weeks of treatment can be seen in Table 3. The results of the analysis showed that the administration of a combination of turmeric flour with various levels of peanut flour had a significant effect ( $P < 0.05$ ) to weight gain. Further test results showed differences between treatments T0 and treatments T1, T2, and T3, while between treatment groups there was no significant difference. fat and protein were compared with the T0 group. This difference also occurred in T0 because it had a higher fiber content than the T1, T2, and T3 treatment groups (Table 2). Wati et al. (2018) protein and energy content are the main components of feed preparation. A good feed is a balanced feed containing all the nutritional needs of livestock. Protein and energy are needed for chicken growth so that protein and energy consumption also affect chicken body weight gain. Chicks are deficient in protein; their growth will be disrupted. Chickens fed a diet with a high protein content will produce better body weight gain than chickens fed a low protein diet. Protein will affect the availability of essential amino acids needed by livestock, for example the amino acids methionine and lysine are very influential on growth (Zuprizal and Kamal, 2005).

Energy is a calorie that is used as fuel that is indispensable in the metabolic process and body functions of livestock, besides that high energy is needed to achieve fast and optimal growth (Mardhotillah et al., 2020). The ration energy utilized by the chicken body comes from the digestion (reshuffle) of carbohydrates, fats, and protein rations. Carbohydrates and protein each contain 4 Cal/g of energy, while fat contains 9 Cal/g of energy (Iskandar, 2012). Mardhotillah et al. (2020) the addition of fat sources can increase the retention time of feed in the intestine or flow rate so that the process of digestion and absorption of non-fat constituents will be more perfect. Production performance and characteristics of chicken carcass fat are influenced by the source of fat in the feed. The extra caloric benefits from fat are generally expressed by improved growth, efficient use of feed, and high metabolic energy content of the feed.

### Effect of Treatment on Feed Conversion

The conversion of KUB hens feed by giving a combination of turmeric flour and various levels of peanut flour for 8 weeks of treatment can be seen in Table 3.

The results of the analysis showed that the treatment had a significant effect ( $P < 0.05$ ) on feed conversion. Further test results showed a significant difference between T0 with T1, T2, and T3. The control treatment T0 showed the highest conversion value and T3 showed the lowest conversion value. The high conversion value at T0 is possible because the crude fiber content is higher than the other treatments (Table 2). These results are in accordance with the report of Wati et al. (2018) that feed broiler chickens with different levels of calliandra flour, the highest feed conversion rate was observed in the addition of 10% calliandra flour with a CF value of 5.11%. The high feed conversion value obtained due to the presence of CF contained in the feed causes the utilization of nutrients to be reduced, so that growth becomes slow (Wati et al., 2018). Dinata. (2008) stated that low CF content will reduce feed conversion rate, feeding turtle ducks with CF content not exceeding 5% gives good results on CFR. Protein content plays an important role in feed conversion. Jamila. (2009), states that high protein content can improve feed quality. The protein consumed will be synthesized into amino acids and used for the formation of meat (Fanani et al., 2016). According to Noferdima et al., (2020) ration conversion tends to decrease along with increasing protein levels because feed conversion depends on ration consumption and body weight gain, the lower the conversion value obtained, the efficiency level increases and the more economical. Differences in protein levels in feed have a significant effect on chicken performance and increase growth performance (Ahmed and Arabi, 2015). The fat content factor in feed also affects the conversion value because fat is the highest energy source (Munisa, 2015). Agustono et al., (2009) stated that energy feed is feed that contains high energy. High energy can improve feed efficiency and weight gain. High energy in the feed will suppress the level of feed consumption. The right protein-energy balance with the right amount of feed will result in good growth and feed conversion. T0 shows the lowest fat content, so this causes a high feed conversion rate compared to other treatment groups. This result is in accordance with Munisa's report (2015) that the value of the relative growth rate in the treatment with the highest fat content of 11% had the highest value compared to the other treatment groups. This is because the greater the energy from feed fat can be used to carry out activities, while the energy source from protein is used to optimize growth. Alexander. (2012) when the main source of energy (starch and fat) is reduced in the body, protein will be used as an energy source. This is an inefficient process, so it is necessary to balance the energy of the protein in the ration to overcome the burning of protein to be used as energy.

### CONCLUSION

Based on the result and discussion, it can be concluded that the treatment with peanut flour substitution is 15% which indicates low consumption, highest PBB, and low FCR.

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