

## The effect of fermented pineapple peels in a diet that contains medicinal weeds on the performance broiler

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**Abstract.** This study aimed to determine the effect of using fermented pineapple peel in the ration containing medicinal weeds on broiler chicken performance. The experiment was designed into a completely randomized design (CRD) with five treatments and five replicates. Treatments consisted of P0 = 0% of fermented pineapple peels meal (FPPM) in ration containing 0% medicinal weed (MW), positive control). P1 = 0% of fermented pineapple peels meal (FPPM) in the ration containing 2 % medicinal weed (MW), negative control). P2 = 7.5% of FPPM in the ration containing 2 % medicinal weed (MW). P3 = 15% of FPPM in the ration containing 2 % medicinal weed (MW). P4 = 22,5% of FPPM in the ration containing 2 % medicinal weed (MW). Two hundred two days of male broiler chicken were used in this study and kept for 42 days. The parameters were feed consumption, average daily weight gain, feed conversion ratio, slaughter weight. The observed data were analyzed by statistical product and service solution (SPSS 16.0), and Duncan's multiple range test tested significant effects among treatments. Results showed that the fermented pineapple peel meal up to 15% with other medicinal weeds was not influenced the broiler chicken performance.

### 1. Introduction

Pineapple peel is a waste pengo the rest of the pineapple fruit processing after being taken inside that number could reach 27% of pineapple production [4]. According to [5] pineapple peel containing water 81, 72 %, crude fiber 20, 87%, carbohydrate 17, 53%, crude protein 4, 41%, and sugar reduction 13, 65 %. [6] reported that the pineapple peel meal still has good nutritional value, dry matter 88.9503%, ash 3.8257%, crude fiber 27.0911%, crude protein 8.7809%, and fat 1.1544%.

Pineapple peel also contains sugar reduction as much as 13.65% as an energy source. Sugar reduction is the sugar that has the skill for reduction; finally, the hydroxide compound's existence will be free and reactive [7] For example, sugar reduction is glucose and fructose. Higher sugar reduction of pineapple peels can provide an energy source for a broiler. However, the use of pineapple peels the limit of feed because of higher crude fiber (19,69%) and low protein crude (3.50%), High fiber foods resulting substance is hard to digest poultry to decrease the digestibility of nutrients, then the best

thing to did it by way of fermentation. According to [8], yogurt is one of the fermentation; yogurt is defined as a food product derived from cow's milk with a shape such as porridge or ice cream, which is fermented milk with *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. According to [9], fermented food material properties change due to the breakdown of ingredients; such changes could be pH, moisture, aroma, and nutritional value changes. Increased crude protein and crude fiber decline in a material can be made by fermentation with yogurt containing the bacteria *Lactobacillus bulgaricus*. Utilization medicinal weeds as Mutiara grass (*Hedyotis corymbosa* or *Oldenlandia corymbosa* L), sidaguri (*Sida cor difolia*), bandotan (*Ageratum conyzoides* L), and patikan kebo (*Euphorbia hirta* L.) with containing medicinal weeds in ration given the best effect of broiler chicken.

The alternative strategy for feeding availability explored the waste from agriculture by-products such as pineapple. Pineapple's potential such as skin content in Jambi never optimally utilized, and source of feed for broiler potentially. Using skin pineapple by-products for poultry diets can be improved the profit income for farmers. The high sugar content of pineapple peels can be improved energy for the broiler. The limitation factor in pineapple peels in diets was high crude fiber (19,69%) and low crude protein (3.50%). The high crude fiber content showed low digestibility in poultry and decreased it with the biological process such as fermentation. One of the strategies to improve the protein content and lowered crude fiber by fermented use microorganisms such as yogurt was *Bacillus* sp. Exactly combine the Yoghurt also supplemented medicinal weed as a *feed additive* to maintain animal health. The medicinal weed was used in this combination, such as Mutiara grass (*Hedyotis corymbosa* *Oldenlandia corymbosa* or L), sidaguri (*the eunuch cor difolia*), bandotan (*Ageratum conyzoides* L.), and patikan kebo (*Euphorbia hirta* L.). Combining all of the medicinal weeds in feed can be improved the quality of feed by nutrient synergy effect in diets.

## 2. Material and Method

Two hundred two days male broiler chicken were cased in this study and kept in 25 cages 80 cm x 80 cm x 100 cm each. Feed and drinking water were of ad libitum. The treatment was different feed, which contained fermented pineapple peel meal by Yoghurt as much of 3 ml/kg for 24 hours, a commercial ration BR1 on BR2, corn, polished, fish, and soybean meal. A feed additive was pearls grass: sidaguri: goatgrass: patikan kebo in 1: 2: 2: 2. The treatment rations were composed of isoprotein and isoenergy. Feed composition and nutrient content treatment diets were shown in Table 1.

The experiment was designed into a completely randomized design (CRD) with five treatments and five replicates [10]. The treatments were P0: =0% of fermented pineapple peels meal (FPPM) in ration containing 0% medicinal weed (MW), positive control), P1 = 0% of fermented pineapple peels meal (FPPM) in the ration containing 2 % medicinal weed (MW), negative control) , P2 = 7, 5% of FPPM in the ration containing 2 % medicinal weed (MW), P3 = 15% of FPPM in the ration containing 2 % medicinal weed (MW), P4 = 22, 5% of FPPM in the ration containing 2 % medicinal weed (MW). Measurement variables were feed consumption, body weight, feed conversion, pancreas, proventriculus, ventriculus, liver, spleen, intestine weight, intestine large, intestine length, and pH of intestine.

### 2.1. Statistical Analysis.

The observed data were analyzed by statistical product and service solution (SPSS) 16.0, and Duncan's multiple range test tested significant effects among treatments.

### 2.2. Fermented Pineapple peel meal

Pineapple skin cleaned is then chopped, then dried in an oven at 60°C. After the pineapple peels were dry, the shaving process is carried out. The addition of water to the pineapple peels flour in a ratio (2: 1) or two liters of water and one kg of pineapple flour the addition of water is carried out to achieve a water content of 60–70%. Steaming is carried out for 30 minutes, which aims to sterilize. After that,

cooling was carried out for 10 minutes before the fermentation process with 3 ml/kg of yogurt for 24 hours.

**Table 1.** Feed composition and nutrient content treatment

Feed Materials	treatment				
	P0	P1	P2	P3	P4
Commercial rations BR II	50	50	50	50	50
corn	15	15	13	5	5
Bran	20	18	12.5	13	5.5
Soybean meal	7	7	7	7	7
Fish flour	8	8	8	8	8
Fermented pineapple skin	0	0	7.5	15	22.5
Medicinal weed	0	2	2	2	2
Total (%)	100	100	100	100	100
nutritional composition **					
Dry material (%)	86.68	85.56	85.02	84.41	83.89
Organic material (%)	90.10	89.27	88.48	87.04	86.46
crude protein (%)	20.85	20.19	20.25	20.53	20.52
crude fat (%)	6.36	5.21	4.79	4.67	4.15
crude fiber (%)	5.20	5.38	5.80	6.97	7.15
Calcium(%)	0.74	0.74	0.72	0.72	0.70
Phosphor (%)	0.59	0.53	0.52	0.50	0.49
Metabolic energy (kcal/kg)*	3003	2953	3027	3051	3142

Note : P0: =0% of fermented pineapple peels meal (FPPM) in ration containing 0% medicinal weed (MW), positive control), (P1) 0% of fermented pineapple peels meal (FPPM) in the ration containing 2 % medicinal weed (MW), negative control), P2 = 7, 5% of FPPM in the ration containing 2 % medicinal weed (MW), P3 = 15% of FPPM in the ration containing 2 % medicinal weed (MW), P4 = 22, 5% of FPPM in the ration containing 2 % medicinal weed (MW). P4 = 22.5%.

\* Results of the analysis of the Integrated Laboratory of the Faculty of Animal Science, Jambi University (2014),\*\* Metabolic energy = 0.725 x Gross Energy (NRC, 1994)

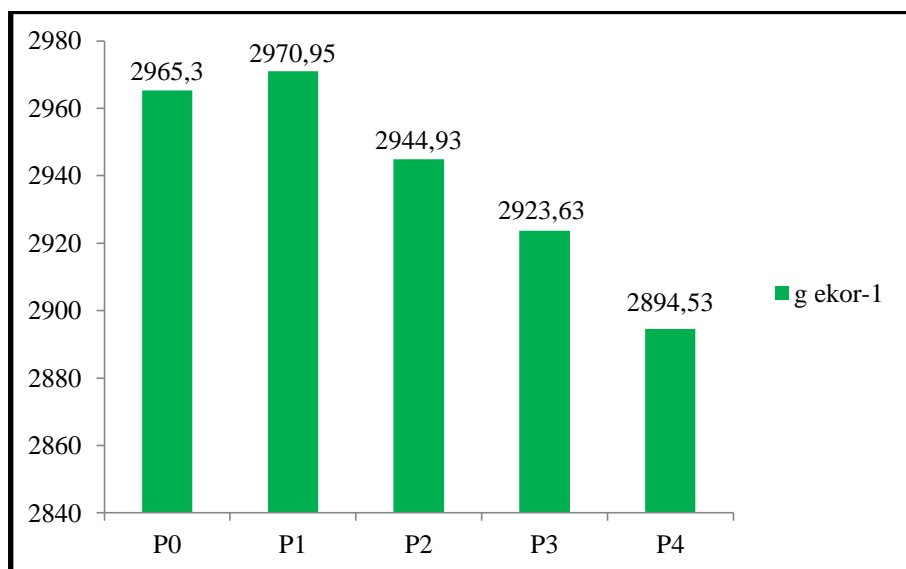
### 2.3. The Process of flouring medicinal Weed meal

Medicinal weeds rumpit Mutiara, sidaguri, bandotan, and patikan kebo with already accumulated, minced, dried, and grind, flouring each weed stirred into one with Mutiara Grass: sidaguri : bandotan: patikan kebo = 1: 2: 2: 2 and used as *a feed additive* in the ration.

## 3. Results and Discussion

### 3.1. Treatment effect on feed consumption

Analysis of variance showed that research on the use of fermented pineapple peels flour in the ration had a very significant effect ( $P < 0.05$ ) on ration consumption (Figure 1). Duncan's multiple follow-up tests showed that ration consumption in treatment P0, P1, P2, and P3 had no significant effect ( $P > 0.05$ ). This shows that the four groups of rations have the same quality and palatability, so that they do not affect livestock preference for rations. The ration consumption in P4 increases significantly. The increase in ration consumption in P4 showed that pineapple skin flour by 22.5% increased ration palatability so that the desire of livestock to consume the ration increased. Consumption decreases when livestock becomes full quickly, caused by bulky food substances such as fiber or water-rich foods. This study's ration consumption ranged from 2894.53-2970.95 g bird<sup>-1</sup> [12].



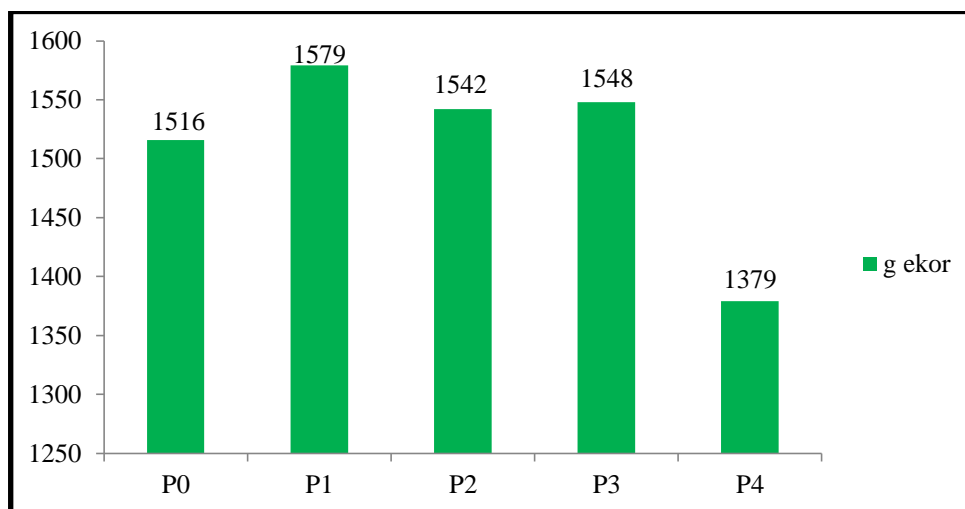
**Figure 1.** Treatment effect on feed Consumption

Based on the practical experience above, the Musi Rawas University Experimental Garden in Muara Beliti conducted an organic fertilizer with the main ingredient of factory *crumb rubber* waste plus vegetable waste, straw, cattle dung, and straw. Using organic decomposing bacteria (ODB), the soil that had initially lost its processing layer and even peeled off looks increasingly loose structure and turns black and productive.

This study tries to use the LP model to minimize costs. A single formulation of organic fertilizer (rubber factory waste) is obtained through this method for a minimal cost solution and compound organic fertilizer (rubber factory waste, straw, vegetable waste, and goat manure).

### 3.2. Treatment effect on Weight Gain

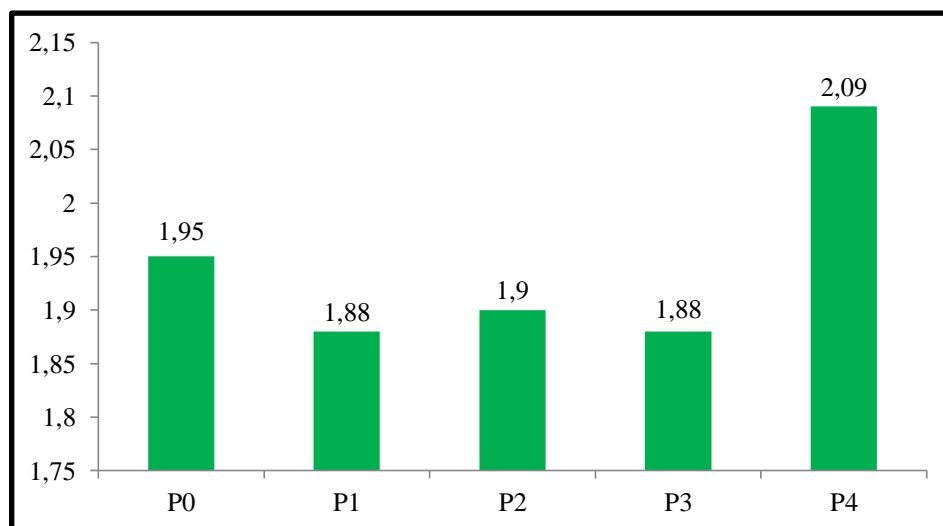
Analysis of variance showed that fermented pineapple peel meal in the feed affected body weight significantly ( $P < 0.05$ ) (Graph 2). Broiler chickens' bodyweight decreases significantly in the group that given pineapple skin flour by 22.5% compared with P0, P1, P2, and P3. It shows that in the P4 treatment using fermented pineapple skin flour 22.5%, the level of chicken palatability to the ration was reduced, so the food consumed was less, and consequently, the body weight gain decreased. The lower the palatability of the birds to the ration, the lower the body weight gain, and conversely, the higher the palatability of the ration, the higher the body weight. Poultry consuming feed containing fermented ingredients could affect organ weight [15-16]. Influencing the weight of the organs will also affect body weight gain Figure 2. Broiler weight gain is affected by the type of ration used, the environment, and the chicken strain. One of the factors that influence the broiler body weight gain is the consumption of feed and the fulfillment of the broiler's dietary requirements [17]. Livestock body weight is always directly proportional to ration consumption; the higher the weight, the higher the ration level [18].



**Figure 2.** Treatment effect on Weight Gain

### 3.3. Treatment effect on Feed Conversion

Analysis of variance showed that the use of yogurt fermented pineapple peel powder had a significant effect on ration conversion ( $P < 0.05$ ) (Figure 3). Duncan's multiple follow-up tests of ration conversion in treatment P0, P1, P2, and P3 had no significant effect ( $P > 0.05$ ); ration conversion showed that there was a significant increase in the level of use of fermented pineapple peel flour of 22.5% compared to control feed that was not given skin flour. Fermented pineapple. Increasing in ration conversion in the P4 treatment was due to the increased palatability of the chickens to the ration and the decrease in body weight so that the conversion rate increased. The higher the ratio conversion rate, the lower the ratio use efficiency [11].



**Figure 3.** Treatment effect on feed Conversion

### 3.4. Treatment effect on Mortality

The mortality rate is one factor that can affect a farm business's success, especially broilers. During this study, the mortality rate was 2%. The mortality rate for broilers is less than 3% [18]. If the mortality rate is more than 6%, the farm's condition is taken seriously and must be paid attention to by the farmer. In this study, fermented yogurt pineapple peels flour worked well in maintaining animal

health as humans are also encouraged to consume yogurt from an early age to maintain a healthy body. Medicinal weeds also play a useful role in medicinal weeds to maintain animal health, which means using fermented, pineapple peels flour and medicinal weeds as feed additives play a positive role in maintaining the health condition of livestock, especially broilers. Factors that influence livestock mortality include the type of chicken, the seeds used, feed, drinking water, temperature, and sanitation [19]

### 3.5. Effect of Treatment on slaughter Weight at 42 Days old chicken

Analysis of the use of fermented pineapple peel flour with yogurt up to a level of 22.5% in the broiler ration gave a very significant effect ( $P < 0.05$ ) on the reduction in slaughter weight of broiler chickens (Figure 4). Slaughter weight on treatment P0, P1, P2, and P3 had no significant effect ( $P > 0.05$ ). This indicates a decrease in treatment P4 with the use of fermented pineapple peel flour as much as 22.5%. 22.5% of the Slaughter weight given feed using fermented pineapple peel flour has a lower carcass weight than chickens fed without fermented pineapple peels. The lower the palatability of the birds to the ration, the lower the body weight gain, and conversely, the higher the palatability of the ration, the higher the body weight. With the low palatability of ration consumption, it is difficult for poultry's basic living needs to be fulfilled. Low protein consumption causes a small bodyweight because protein intake for growth is not sufficient so that chickens do not grow properly [22].

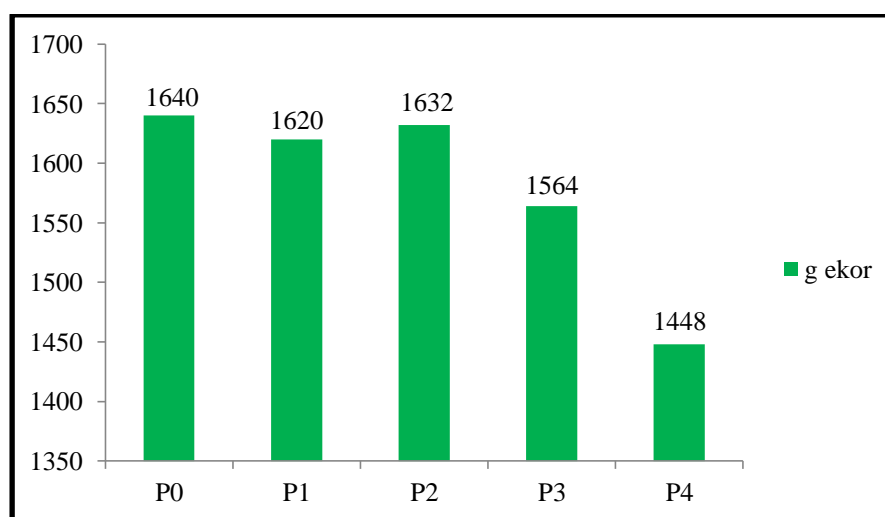


Figure 4. Treatment on slaughter Weight at 42 Days old chicken

## 4. Conclusions

The effect of adding fermented pineapple peel meal up to 15% with other medicinal weeds did not affect weight gain and ration consumption.

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