

## **BIBLIOGRAPHY**

MANGAOANG, AUGUSTO M. APRIL 2012. The Effect of Saluyot Leaf Meal as a Feed Supplement on the Performance of Meat-Type French Chicken.

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## **ABSTRACT**

This study was conducted at the Benguet State University, Balili, La Trinidad, Benguet from October to December 2011.

The study was conducted to determine the response meat-type French chicken given different levels of saluyot leaf meal. Specifically, it aimed to determine the effect of saluyot leaf meal as a feed supplement on the gain in body weight, find the best level of saluyot leaf meal as a feed supplement for meat-type French chicken and determine the most economical level of saluyot leaf meal as a feed supplement.

Results of the study showed no significant differences in the initial weight and total feed consumption. The overall mean of initial and total feed consumption were 0.15064 kg at 8 days of age and 5.64 kg for a period of 42 days. Highly significant differences were observed in the final weight, total gain in weight, feed conversion ratio and feed cost per kg gain. The overall mean of final weights at 50 days of age, total gain in weight for a period of 42 days of age, feed conversion ratio and feed cost per kg gain were 1.91 kg, 1.76 kg, 3.23 and Php118.61, respectively. Mortality and morbidity were not observed within the duration of the study.

Although the net profit and return on investment (ROI) were not subjected to statistical analysis, results of the study showed that better ROIs were obtained from the



treatment fed with pure commercial feeds with the ROI of 21.78% than the birds given saluyot leaf meal at the levels of 20g saluyot/ kg of commercial feeds with the ROI of 16.97%, 40g saluyot/ kg of commercial feeds with the ROI of 9.37% and 60g saluyot/ kg of pure commercial with the ROI of -1.76%.

It is therefore concluded that saluyot leaf meal can be used as supplement to commercial feeds to French chicken without detrimental effect on their growth performance. However, the cost in relation to ROI showed be considered. It is quite costly because saluyot is also being utilized for human consumption. The use of saluyot as feed supplement for chicken depends upon the discretion of the raiser.



## INTRODUCTION

Feeding has a great effect in the growth performance of broilers. It is important that poultry raisers need to know and understand the nutritional requirements, care and feeding management of broilers to come up with cheap nutritionally balance ration.

Broiler production is one of the major sources of livelihood for some farmers because it generates profit that is in a short period of time. It can also be raised even in a limited space and the meat is very good source of animal protein for human consumption. However, the increasing demand for broiler can hardly be met by poultry produces due to mainly increasing cost of production particularly feed costs.

High cost of commercial feeds is due to the fact that most of the feed ingredients are imported. Aside from this, man also competes in the consumption of some products that are used as animal feed such as corn, fish meal, and other. This situation leads to the high cost of feed ingredients.

Because of high costs of feeds, poultry men keep on researching and trying to establish other feed supplements that can be found locally. They do this in order to save them from the very high cost of feed intake of poultry birds given them as supplements. An example of this is saluyot leaf meal.

Saluyot leaf meal can be used as feed supplement for broilers. Like kangkong, katuray leaves, malungay leaves, pechay, cabbage and other leafy vegetable. Saluyot contains high levels of vitamin A value, vitamin C and minerals that are needed by the birds in attaining the target body weight.

Specifically Chen and Saad (1981) as cited by Duke (1983) reported that saluyot leaves contains:



<u>NUTRIENT COMPOSITION</u>	<u>CONTENT</u>
Moisture	84.1 g
Calories	58.0 g
Protein	5.6 g
Fat	0.3 g
Carbohydrate	12.4 g
Fiber	2.0 g
Ash	2.4 g
Potassium (K)	444 g
Vitamin A (Carotene)	7, 850 ug
Vitamin B <sub>1</sub> (Thiamine)	0.15 mg
Vitamin B <sub>2</sub> (Riboflavin)	0.53 mg
Vitamin C (Ascorbic Acid)	80 mg

This study was conducted to find out the effect saluyot leaf meal as a feed supplement on the growth performance meat-type French chickens. The result of this study may be used by researchers, poultry raisers and students interested in poultry meat production. It can also serves as basis for other researcher to come up with other researches.

The study generally aimed to determine the effect saluyot leaf meal as supplement to commercial ration on the growth performance of Meat-type French chickens. Specifically, this study aims to determine the effect of saluyot leaf meal as a feed supplement on the gain in body weight, find the best level of saluyot leaf meal as a feed



supplement for meat-type French Chicken, and determine the most economical level of saluyot leaf meal as feed supplement.

This study was conducted at the Poultry Experimental House of Benguet State University, La Trinidad, and Benguet from October to December 2011 at the period of 50 days.



## REVIEW OF LITERATURE

Bautista (1977) stated that green leafy vegetables such as Chinese cabbage, pechay, mustard, kangkong, cabbage, saluyot, katuray leaves and leaves of sweet potato, ampalaya, sitaw, gabi, chayote, malungay, squash, are rich in Vitamin A, Vitamin C have large percentage of the allowing Vitamin A. and minerals. He also said the green leaf and yellow supply of vegetable.

According to Cabanayan (1981), cooked chopped kangkong, with higher concentration protein-rich in Vitamin supplement, could be used as feed supplement. He found that combination of 60% rice bran and 20% commercial feeds had the highest gain in weight in the performance of broiler. In regards to feed consumption, the final conversion efficiency and feed cost per kilogram gain in weight was the best treatment.

According to Relosa (1981) revealed the different level of katuray leaf meal there was no highly significant compared to commercial feeds, in regards to total gain weight, feed conversion ration, feed consumption cost feed to produce a kilogram in weight and the final weight in the performance of broiler.

Dumaging (1981) stated that there were highly significant differences in the initial weight and the total effect of malungay leaf meal on the performance of broilers. In addition, the experimental revealed that 3% malungay leaf meal was not found the most economical when added to commercial feeds. Malungay leaf meal can be used as feed supplement without affecting their growth since no determinant effect was noted; neither mortality in any of their treatment (Capua, 1981).



## MATERIALS AND METHODS

The materials used are 160 straight-run Sunshine chickens, commercial feeds, brooding-rearing cages, weighing scale, newspapers sheets, feeding and drinking troughs, record book, ball pen, stick brooms, disinfectant, 100 watts incandescent bulbs and saluyot leaf meal (SLM).

Pre-experimental phase. A week before the arrival of the chicks, all equipments were cleaned and disinfected. The floor of the brooders was covered with old newspaper sheets to help conserve heat during brooding period and serve as feed receptacles during the first days of brooding. The 100 watt bulbs were installed as a source of heat to the chicks.

Upon arrival, the chicks was placed inside the brooder and fed with chick booster feeds. Water was available to them at all times.

Saluyot leaves and shoots were collected from La Union. The fresh weight of the collected leaves was taken and recorded. After getting the fresh weight, the leaves would sun-dried until 80% of the moisture has evaporated as reflected by the dry weight (20% DM).

Experimental design and treatments. Following the Completely Randomized Design (CRD), the 160 broiler chick was divided into four treatments. Each treatment was replicated four times with 10 birds per replication making a total of 40 birds per treatment.



The different treatments were the following:

T<sub>0</sub>= pure commercial feeds

T<sub>1</sub>= 20g SLM per kilogram of commercial feeds

T<sub>2</sub>= 40g SLM per kilogram of commercial feeds

T<sub>3</sub>= 60g SLM per kilogram of commercial feeds

Care and management of birds. All the experimental birds was subjected to the same feeding and management practices except for the level of saluyot leaf meal that was given in accordance to the different treatments. The saluyot leaf meal was mixed with the feeds given to the birds. The addition of saluyot leaf meal was from the 8<sup>th</sup> day to the 50<sup>th</sup> day of the study. Mash feeds were used to allow sufficient mixing of leaf meal and commercial feeds.

#### Data Gathered

1. Initial weight of the birds (kg). This was the weight of the birds at the start of the study on the 8<sup>th</sup> day.
2. Final weight of the birds (kg). This was the weight of the birds at the end of the study at 50 days of age.
3. Feed leftover and feed refused (g). This was the amount of feeds not consumed, or wasted which will be obtained every day before feeding in the morning.
4. Cost of production (Php). This includes the cost of stocks, feeds, labor and other materials that was used in the study.
5. Morbidity. This was the number of birds that may get sick during the duration of the study.





6. Mortality. This was the number of birds that may die during the duration of the study.

Data Computed:

1. Total gain in weight of the birds (kg). This was obtained by subtracting the initial weight from the beginning until the termination of the study.

2. Total feed consumption (kg). This was obtained by adding the total amount of feed eaten by the birds from the beginning until the termination of the study

3. Feed conversion ratio. This was obtained by dividing the total feed consumption by the gain weight.

4. Feed cost/ Kg gain. This was the cost of feeds given to the birds per kg of gain in weight

5. Morbidity rate (%). This was computed by dividing the number of sick birds by their initial number multiplied by 100.

6. Mortality rate (%). This was computed by dividing the number of dead birds by their initial number multiplied by 100.

7. Gross income. This was obtained by multiplying the final weight of the birds by their price per kilogram live weight.

8. Net income. This was obtained by subtracting the total cost of production from the total sales or gross income.

9. Return on investment. This was obtained by dividing the net income by the total expenses multiplied by 100.



The data gathered was consolidated, tabulated and analyzed using the Analysis of Variance for Completely Randomized Design (CRD) and treatment means will be compared using the Duncans Multiple Range Test (DMRT).



## RESULTS AND DISCUSSION

### Initial and Final Weight

The initial weights of the birds in different treatments are presented in Table 1. Statistical analysis showed that there were no significant differences in all treatments in the initial weights of French chicken at 8 days of age while there were highly significant differences in final weights of the birds. It implies that the birds at the start of the study had comparable weights and at the end, the birds given commercial feeds, 40 g saluyot leaf meal /kg of pure commercial feeds and 60 g saluyot leaf meal /kg pure commercial feeds were heavier than the birds fed with 20 g saluyot leaf meal/kg pure commercial feeds. The mean of the final body weight with comparable weights are 1.91kg, 1.97kg and 1.94 kg, respectively and 1.81 kg for the mean of treatment fed with 20 g saluyot leaf meal /kg pure commercial feeds. The heaviest body weight in the different treatment is attained in treatment fed with 40 g saluyot leaf meal/ kg commercial feeds followed by treatment fed with 60 g saluyot leaf meal/ kg commercial feeds and treatment fed with commercial feeds and lastly treatment fed with 20 g saluyot/ kg commercial feeds.

Table 1. Initial and final weights of the birds under different treatments (kg)

TREATMENT	BODY WEIGHT	
	INITIAL (at 8 days of age)	FINAL (at 50 days of age)
Control (commercial feeds)	0.15	1.91 <sup>a</sup>
20 g saluyot leaf meal/ kg commercial feeds	0.15	1.81 <sup>b</sup>
40 g saluyot leaf meal/ kg commercial feeds	0.14	1.97 <sup>a</sup>
60 g saluyot leaf meal/ kg commercial feeds	0.14	1.94 <sup>a</sup>

Means with no superscript are not significantly different at 5% level by DMRT.



### Total Gain in Weight

The total gains in weights of the birds for in the different treatments are presented in Table 2. Consequent with the trend in body weights, the gain in weights of the birds given 40 g saluyot leaf meal/ kg commercial feeds and pure commercial feeds were comparable to the 60 g saluyot leaf meal/ kg commercial feeds and higher than the group fed with 20 g saluyot leaf meal. The total gain in weight of birds for 42 days given 20g saluyot/ kg of commercial feeds (1.66) was significantly lower than the total gain in weight of birds given pure commercial feeds (1.76), 40g saluyot/ kg commercial feeds (1.82) and 60g saluyot/ kg commercial feeds (1.71). The treatment with the highest mean was attained in 40 g saluyot/ kg commercial feeds with 1.82 kg, followed by pure commercial feeds with 1.76kg, and 60 g saluyot leaf meal/ kg commercial feeds with 1.71 kg and lastly was the 20 g saluyot leaf meal/ kg commercial feeds with 1.66 kg.

### Total Feed Consumption

The feed consumption of birds in the different treatments is presented in Table 3. Statistical analysis showed that there were no significant differences between treatment means. The birds under pure commercial feeds had the mean total feed consumption of 5.63 kg and those birds under 20g of saluyot leaf meal /kg of commercial feeds, 40g of saluyot leaf meal /kg of commercial feeds, 60g of saluyot leaf meal /kg of commercial feeds had the mean of 5.64 kg, 5.64 kg, and 5.6 kg respectively. The feed consumed by the French chicken were not significant because they are fed with the same amount of feeds throughout the experiment which prove that there are no biases in feeding the experimental birds.



Table 2. Total gain in weight for 42 days

TREATMENT	GAIN IN WEIGHT (kg)
Control (commercial feeds)	1.76 <sup>a</sup>
20 g saluyot leaf meal/ kg commercial feeds	1.66 <sup>b</sup>
40 g saluyot leaf meal/ kg commercial feeds	1.82 <sup>a</sup>
60 g saluyot leaf meal/ kg commercial feeds	1.71 <sup>a</sup>

Means with no superscript are not significantly different at 5% level by DMRT.

Table 3. Total feed consumption for 42 days

TREATMENT (kg)	FEED CONSUMPTION
Control (commercial feeds)	5.63
20 g saluyot leaf meal/ kg commercial feeds	5.64
40 g saluyot leaf meal/ kg commercial feeds	5.64
60 g saluyot leaf meal/ kg commercial feeds	5.64

Means with no superscript are not significantly different at 5% level by DMRT.

### Feed Conversion Ratio

The feed conversion ratio of the birds in the different treatments is presented in Table 4. On this parameter, statistical analysis showed that there were highly significant differences between the feed conversion ratio of the birds in all treatment. The best feed conversion ratio recorded were 3.10 and 3.15 which were taken from the groups fed with 40 g saluyot leaf meal/ kg commercial feeds and 60g saluyot leaf meal/ kg commercial



feeds, respectively. On the contrary, the birds given pure commercial feed and those given 20 g saluyot/ kg commercial feeds had FCR's of 3.23 and 3.43, respectively and

Table 4. Feed conversion ratio

TREATMENT	FCR
Control (commercial feeds)	3.23 <sup>a</sup>
20 g saluyot leaf meal/ kg commercial feeds	3.43 <sup>a</sup>
40 g saluyot leaf meal/ kg commercial feeds	3.10 <sup>b</sup>
60 g saluyot leaf meal/ kg commercial feeds	3.15 <sup>b</sup>

Means with no superscript are not significantly different at 5% level by DMRT.

the treatment fed with 40g saluyot/ kg commercial feeds has the highest feed conversion ratio followed by 60g saluyot/ kg commercial feeds then fed with commercial feeds and lastly the treatment fed with 20g saluyot/ kg commercial feeds which has the lowest feed efficiency.

#### Feed Cost to Produce a Kilogram Broiler

The cost of feed to produce a kilogram of broiler in the different treatment is presented in Table 5. Statistical analysis showed that there were highly significant differences observed among treatments. The lowest feed cost among the treatment was obtained in the group fed with pure feeds having a mean of Php89.55. Birds supplemented with 60g saluyot leaf meal had the highest feed cost with a mean of Php144.45 compared to treatments fed with 20g saluyot/ kg commercial feeds and 40 g saluyot/ kg commercial feeds with the mean of Php114.65 and Php125.80, respectively. This shows that despite the control group having lower feed efficiency, the feed cost to produce a kilogram gain



was cheaper. Commercial feed is therefore seen to be the most economical in terms of feed cost per gain.

#### Mortality and Morbidity Rate

The good health of the birds was maintained all throughout the study period. This indicates that the birds had more or less showed good performance against disease as well as proper care and management of the researcher.

#### Return on Investment

Table 6 shows the cost and return analysis per treatment and the details of expenditures are presented in Appendix Table 8. Even though this was not subjected to statistical analysis as presented in the table, it is shown their higher profit was obtained from the birds fed with commercial feeds. This implies that supplementing 20g saluyot/ kg commercial feeds, 40 g saluyot/ kg commercial feeds and 60g saluyot/ kg commercial feeds on broilers diet resulted to a lower income than feeding pure commercial feeds. The treatment with highest ROI of 21.78% was in the pure commercial feeds followed by treatment fed with 20 g saluyot/ kg commercial feeds with ROI of 16.97%, hen treatment fed with 40 g saluyot/ kg commercial feeds with ROI of 9.37% , and lastly treatment fed with 60 g saluyot/ kg commercial feeds with ROI of -1.76%.



Table 5. Feed Cost per Kilogram gain in weight (Php)

TREATMENT	FEED COST (Php)
Control (commercial feeds)	89.55 <sup>d</sup>
20 g saluyot leaf meal/ kg commercial feeds	114.65 <sup>c</sup>
40 g saluyot leaf meal/ kg commercial feeds	125.80 <sup>b</sup>
60 g saluyot leaf meal/ kg commercial feeds	144.45 <sup>a</sup>

Means with no superscript are not significantly different at 5% level by DMRT.

Table 6. Return on Investment (ROI) of birds under different treatment (Php)

TREATMENT	TOTAL SALES (Php)	TOTAL COST OF PRODUCTION (Php)	NET PROFIT (Php)	ROI (%)
Pure commercial feeds	10, 831.50	8, 894.00	1, 937.50	21.78
20g Saluyot leaf meal/ kg commercial feeds	11, 281.00	9, 644.00	1, 637.00	16.97
40g saluyot leaf meal/ Kg commercial feeds	11, 368.00	10, 394.00	974.00	9.37
60g saluyot leaf meal/ Kg commercial feeds	10, 947.50	11, 144.00	-196.50	-1.76





## SUMMARY, CONCLUSION AND RECOMMENDATION

### Summary

This study was conducted to determine the effect of saluyot leaf meal on the growth performance of meat-type French chicken. This was conducted at Benguet State University Poultry Experimental House, Balili, La Trinidad, Benguet from October to December 2011.

One hundred sixty (160) 8 days old meat type French chicken were distributed into four treatments following the Completely Randomized Designed (CRD). Four treatments were replicated four times with 10 birds per replication. The treatments used were Pure commercial feeds, 20g saluyot leaf meal/ kg commercial feeds, 40g saluyot leaf meal/ kg commercial feeds) and 60g saluyot leaf meal/ kg commercial feeds.

Results of the study show no significant differences in term of initial weight and total feed consumption. The overall mean of initial and total feed consumption were 0.15064 kg at 8 day of age and 5.64 kg for a period of 42 days. On the other hand, significant differences were observed in the feed left over. The mean total of feed left over was 0.62688 kg. Highly significant differences were observed in the final weight, total gain in weight, feed conversion ratio and feed cost per kg gain. The overall mean of final weights, total gain in weight, feed conversion ratio and feed cost per kg gain were 1.91 kg, 1.76 kg, 3.23 and 118.61Php, respectively. Mortality and morbidity were not observed within the duration of the study. Although the net profit and return on investment (ROI) were not subjected to statistical analysis, results of the study showed that better ROIs were obtained from the control groups than the birds given saluyot leaf meal at the levels of 20g to 60g.



## Conclusion

There are highly significant differences in the performance of meat- type French chicken, except in the feed left over which are highly significant and initial weights, total feed consumption were no significant differences. Based on the results of the study, it is therefore concluded that saluyot leaf meal can be supplemented with commercial feeds allowable to the birds without detrimental effect on their growth performance and it is therefore concluded that it has effect on the body weight of the birds fed of saluyot leaf meal.

## Recommendation

It is not recommended that saluyot leaf meal as a feed supplement due to its high cost and competing for human consumption which means that man would rather prefer saluyot as a food for humans than to give it to the animals and the ROI of birds fed with commercial feeds has a higher return on investment than the birds fed with saluyot leaf meal.



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