

BIBLIOGRAPHY

MANOLO, IRIS B. APRIL 2013. Growth Performance of Native Chicken Given Commercial Feeds and Sweet Potato Leaves. Benguet State University, La Trinidad, Benguet.

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ABSTRACT

The study was carried out to determine the effect of commercial feeds and sweet potato leaves on the growth performance of native chickens. Specifically, it was conducted to determine the growth performance of native chickens in terms of gain in weight, feed consumption, feed conversion ratio, morbidity and mortality, and profitability of raising native chicken given commercial feed and sweet potato leaves. This was conducted at the BSU Poultry Experimental Area, Balili, La Trinidad, Benguet.

A total of thirty native chickens were distributed into two treatments following Randomized Completely Block Design (RCBD). Each treatment had three blocks with 5 birds per block making a total 15 birds per treatment. Birds in the control treatment were given commercial feeds *ad libitum* while in birds treatment 1 were given commercial feeds and sweet potato leaves on a restricted time. All the birds were confined throughout the study and subjected to the same care and management except for the kind of ration given. Statistical analysis showed no significant differences between the two treatments in terms of initial and final weights, gains in weight (daily, weekly, total), feed intake (DM basis), feed conversion ratio, and return on investment. A mean initial weight of the bird was 0.246 kg and a mean final weight of the bird was 1.429kg after 82 days of feeding.



INTRODUCTION

The Philippine native chicken is a type of chicken commonly raised in the backyard. They are sometimes turned loose into scavenge while some are housed in semi-confinement. Although, native chicken is comparatively poor in egg and meat producer, they remain a very important source of protein and provide additional income to the farmers (Wu, 1999).

Garcia (2006) added that it is not just a main source of eggs and meat for the family but it also plays an important role in the culture of people. Elders or folk prefers native chicken together with native pig as sacrificial animals for rituals. *Pinikpikan*, an indigenous well known menu in the Cordillera, has native chicken as the main ingredient and is often served to visitors and guests and on family gatherings.

Raising native chicken requires lesser production input and do not need much and special feeds for survival. They are easy to maintain wherein they are just allowed to seek their own food, or just given kitchen left over, *palay*, fruits, and vegetables. Native chickens are relatively small in size, and have slow growth rate. Giving commercial feeds and green supplement to the birds is a good way to find out if their growth rate will be improved.

Plant as feed supplement makes the animal healthy and resistant to disease due to its large quantities of vitamins and minerals. Sweet potato (*Ipomoea batatas*) is a well known feed supplement for animals especially for pigs and poultry. This plant easily grows in the backyards and free range chicken can have access to it during the day.



Results of this study would contribute data on the performance of native chickens when given high energy diets and green supplements such as commercial feeds and sweet potato leaves, respectively.

The study generally aimed to find out the effect of chopped sweet potato leaves and commercial feeds on the growth performance of native chicken. Specifically, it aimed to determine the gain in weight, feed consumption, feed conversion ratio, morbidity and mortality, and profitability of raising native chicken given chopped sweet potato leaves and commercial feeds.

This study was conducted at the BSU Poultry, Balili, La Trinidad, Benguet from October 2012 to January 2013.



REVIEW OF LITERATURE

The Philippine Native Chicken

The domestic native chicken (*Gallus gallus domesticus*) is a mixture of different breeds. They are small, active, sensitive and capable of great flight when frightened. The hens have excellent mothering ability and excellent sitters. Under normal backyard production, the native hen produces 30 to 60 eggs per year. However, when properly managed, it may reach up to 120 to 200 eggs per year (Molitas, 1999).

Bondoc (1998) as cited by Garcia (2006), the adult size of native chickens is usually small. Generally, the male weighs an average of 1.3kg and the female weighs 1kg. They are nervous and flighty. The females are broody and have strong maternal instincts. A chicken lay only about 40-60 eggs a year. This is because they are allowed to incubate their eggs and their natural broodiness is allowed to set in. But with improved management and a better nutrition, native hens lay 130- 200 eggs a year.

According to Scanes (2004) native chickens were raised essentially as scavengers in the backyard and farmyards. There is still considerable potential for continuation and expansion of this small scale approach in many communities. The addition of egg and meat protein to protein deficient diets, together with cash income can make small scale poultry production is very appealing.

There are few farms of native chicken found in the Philippines. Almost all native chickens are raised in backyards just for households only. Only few farmers sell their native chicken in the market. Farmer prefers native chicken because it does not require special care and feeds but they have nutritious products that are free from toxins compared to



commercial broilers. Native chicken does not require high cost of production and capitals and they could thrive under rugged conditions (Tolentino, 2009).

In the highlands, native chickens serve as a source of their food. Many claimed that native chicken meat is more delicious than commercial broiler meat and to think that the broilers are normally fed with balance diet. On the other hand, native chicken are simply fed with *palay*, corn and even left over, cooked rice. However, in most cases they are let loose and that they eat different plant leaves aside from what they get from the soil when they go scratching (Catagan, 1997).

PCCARD (2000), recommended the provision of shelter to native chicken made of bamboo, scrap wood, wire mesh or net for their protection against predators and the effects of the element of the weather, better control of disease, disturbance to vegetable gardens and neighbor's property by free-ranging.

Native Chicken Inventory

Based on the data gathered by the Bureau of Agriculture Statistics (BAS) in 2012, the inventory of native chicken (heads) in the Philippines is 315,957,240 in 2009; 309,708,390 in 2010 and 305,310,167 in 2011. Cordillera Administrative Region contributes to the said inventory with 5,366,048; 5,542,169; and 5,849,952 in 2009, 2010, and 2011 respectively.

Sweet Potato as Feed Supplement

Sweet potato (*Ipomoea batatas*) is a slender, perennial, herbaceous vine belonging to the convulvulaceae family. Sweet potato leaves have high crude protein content ranging from 25% to 29% in dry matter. It also contains iron, calcium, vit. A and E, riboflavin and



carotene. Sweet potatoes are relatively abundant in the Cordillera where in it is planted not only for human consumption but also for animal feed. Cordillerans are continuing planting sweet potato not only for human consumption, but for animal feeds. Almost all animals in the locality are fed with sweet potato, like hogs, chickens, dogs and ducks (UPWARD, 1992).

Dried sweet potato leaves and vines can be used in poultry rations as a source of protein and carotenoid, particularly beta-carotene and xanthophylls, and have been included in diets to enhance the yellow pigmentations of broiler skins and egg yolks (Heuze *et al*, 2011).



MATERIALS AND METHODS

Materials

The experimental animals that were used in this study were thirty native chickens with ages ranging from four weeks to eight weeks. Experimental birds include those non-descript breeds of colored chicken raised in the backyards. Commercial feeds and sweet potato leaves were used as experimental diets. Other materials that were used in the study are cages, feeders and waterers, weighing scale, leg bands, and recording materials.

Methods

Preparation of cages, feeders, and waterers. The native chickens were raised in full confinement throughout the study. A week before the start of the study the cages, feeders and waterers were cleaned and disinfected.

Experimental design and treatments. Due to the varying ages of the birds, the layout for Randomized Completely Block Design (RCBD) was followed. The birds were grouped into three, as follows: block 1 = 4 weeks old; block 2 = 6 weeks old; and block 3 = 8 weeks old. Each group was then distributed at random into the two treatments with five birds per block making a total of 15 birds per treatment. The diet to be given to each treatment was introduced a week before the actual start of the study. After this adjustment period, the birds were weighed for their initial weights.

The treatments used in the study are the following:

T₀- commercial feeds

T₁-commercial feeds + chopped sweet potato leaves



Preparation of sweet potato leaves. Sweet potato leaves (Figure 1) were harvested in the garden and washed thoroughly to remove unnecessary particles and air-dried for two hours. The leaves were chopped into small pieces of about one cm (Figure 2)



Figure 1. Fresh sweet potato leaves



Figure 2. Chopped sweet potato leaves

Feeding management. The birds in the control treatment were given commercial feeds on *ad libitum* basis, while the birds in treatment 1 were given commercial feeds and chopped sweet potato leaves separately on a restricted time. Commercial feed was given twice a day from 6 am to 8 am in the morning, and 4 pm to 6 pm in the afternoon. After the specified time, any left-over were withdrawn and measured as left over. On the other hand, chopped sweet potato leaves were given *ad libitum* from 9 am to 3 pm. After the specified time, any left-over were withdrawn. This feeding scheme was followed throughout the study.

Care and management. All birds were subjected to the same care and management except for the kind of ration that were given to them. The ration depended on the treatment where they were assigned.

Data to be Gathered

1. Initial weight (kg). It was taken by weighing the birds individually at the start of the study wherein the birds were about four to eight weeks of age.
2. Final weight (kg). It was taken by weighing the native chicken after eighty-two days of feeding trial.
3. Weekly weight (kg). This was obtained by weighing the birds individually at weekly interval.
4. Amount of feed offered (kg). It was determined by weighing the feed offered on a dry matter basis from the start of the study until the end.
5. Amount of feed left-over (g). This was determined by weighing the refused feed including the spilled ones.
6. Dry matter content of sweet potato. This was obtained by oven drying the feed sample to constant weight.
7. Morbidity. This refers to the number of birds that got sick during the study.
8. Mortality. This refers to the number of birds that died during the study.
9. Production cost (Php). This is the cost of each item used like feeds, stock, etc.

Data Computed

1. Total gain in weight (kg). This was obtained by subtracting the initial weight from the final weight of the bird.
2. Daily gain in weight (kg). This was the difference between the final weight and initial weight of the experimental birds divided by 82 days.
3. Total feed intake (kg). This was obtained by subtracting the total amount of leftover feeds from the total feed offered.



4. Percent dry matter (%DM). This was obtained by using the formula:

$$\% \text{ DM} = \frac{\text{Oven dry weight of samples} \times 100}{\text{Fresh weight of sample}}$$

5. Dry matter intake (DMI). This was obtained by using the formula:

$$\text{DMI} = \text{Fresh weight intake} \times \% \text{ DM}$$

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

7. Feed cost per kg gain (Php). This was obtained by multiplying the feed conversion ratio by the cost per kg of feeds.

8. Return on investment (ROI). This was calculated using the formula:

$$\text{ROI} (\%) = \frac{\text{Gross Sales} - \text{Total Expenses}}{\text{Total Expenses}} \times 100$$

Statistical Analysis

All data were analyzed using Analysis of Variance (ANOVA) appropriate for Randomized Complete Block design (RCBD). Means were compared using the Least Significant Difference (LSD).



RESULTS AND DISCUSSION

Body Weights

Initial weight. The initial weights and final weights of the birds are shown in Table 1. T₀ (commercial feeds) had a mean of 0.225 kg, while the birds in T₁ (commercial feeds and sweet potato leaves) had a mean of 0.266 kg. Statistical analysis revealed that there is no significant difference which means that the birds in the two treatments were more or less of the same weight at the start of the study.

Highly significant differences were found on the initial weights among blocks. This can be attributed to the two-week difference in the age of the birds per block. Another factor that could be considered is the fact that the birds came from different broods and received different care and management before the start of the study.

Final weight. In terms of the final weights, statistical analysis revealed that there are no significant differences between the two treatments. The average final weights of the birds given commercial feeds had a mean of 1.416 kg, while the birds given commercial ration and sweet potato leaves had a mean of 1.429 kg. This implies that the birds between the two treatments had comparable weights at the end of the study.

Table 1. Initial weight (4 to 6 weeks old) and final weight (16 to 18 weeks old) of the birds

TREATMENTS	INITIAL WEIGHTS (kg)	FINAL WEIGHTS (kg)
Commercial feeds	0.226 ^a	1.43 ^a
Commercial feeds + sweet potato leaves	0.255 ^a	1.42 ^a



Means with the same superscripts are not significantly different ($P \geq 0.05$) LS

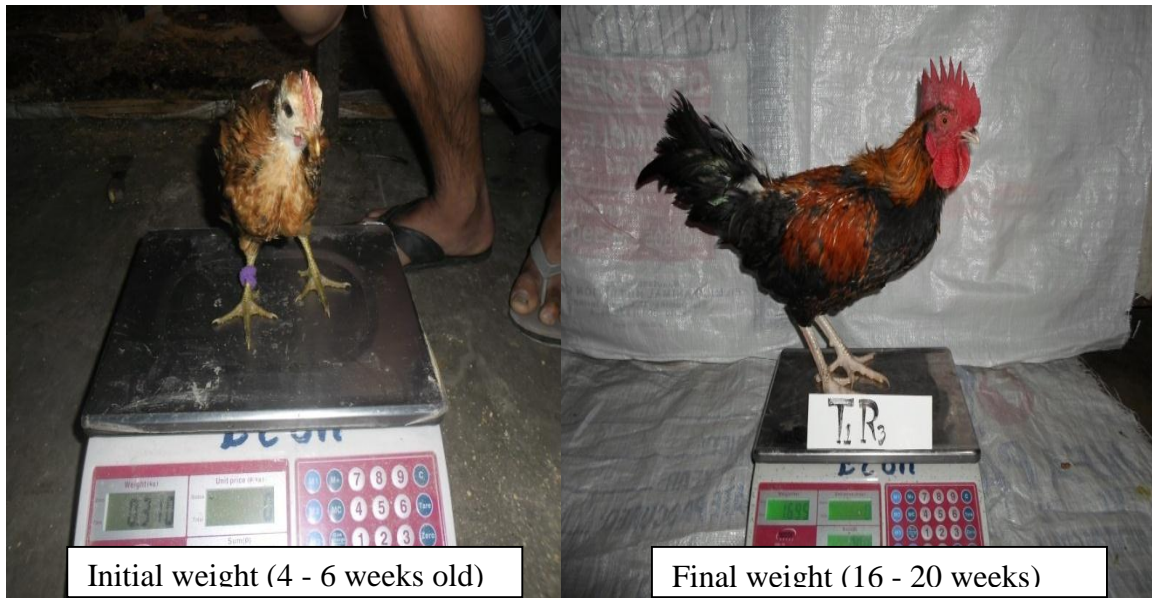


Figure 3. Weighing for initial and final weight

Total Gain in Weight

Table 2 presents the mean gain in weight of the birds on daily and weekly basis, as well as the total gain after 82 days of feeding trial. Similar to the final weight, the birds given commercial ration had comparable gain in weight to the birds given commercial ration and sweet potato leaves as shown by statistical analysis. Birds fed with commercial ration and those given commercial ration and sweet potato leaves gained a total weight and average daily gain of 1.140 kg and 0.014 kg, respectively.

Figure 4 shows that the birds in the two treatments have almost the same growth trend with consistent increase up to the 11th week. This is confirmed by the non significant result of the statistical analysis. This means that the birds in both treatments had comparable gain in weight on daily and weekly basis.

Table 2. Total and average daily gain in weight of the birds

TREATMENTS	GAIN IN WEIGHT (kg)	
	TOTAL	DAILY
Commercial feeds	1.178	0.014
Commercial feeds + sweet potato leaves	1.012	0.013

Means without superscript are not significantly different ($P \geq 0.05$) LSD

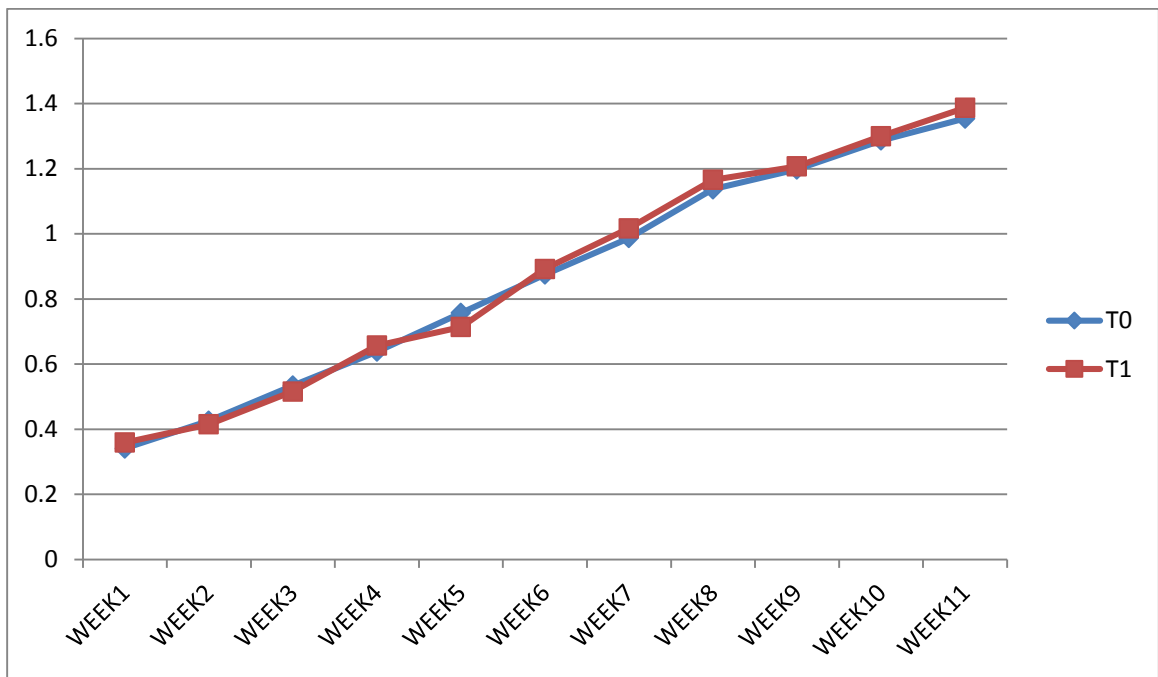


Figure 4. Weekly weight of the birds (kg)

Total Feed Intake

The mean feed intakes of the birds under the two treatments are shown in Table 3. Feed intake as fed had a significant difference between the treatments. This is due to the high moisture content of watercress which is 84%. However, when these are expressed on dry matter basis, feed intakes of the birds are comparable. Birds given commercial



Table 3. Total feed intake of the birds in 82 days of feeding

TREATMENTS	TOTAL FEED INTAKE (kg)	
	(AS FED)	(DM BASIS)
Commercial feeds	6.05	5.32
Commercial feeds + sweet potato leaves	6.81	4.66

Means with the same superscript are not significantly different ($P \geq 0.05$) LSD

ration only consumed feeds a with a mean of 5.323 kg while those birds given commercial ration and sweet potato leaves had a mean of 4.661 kg.

Feed Conversion Ratio

Table 4 presents the feed conversion ratio of birds given commercial ration (T_0) and birds given commercial ration and sweet potato leaves (T_1). Statistical analysis shows that there are no significant effects between the treatments. The FCR of the birds in T_0 is 4.83 and 3.94 for the birds given commercial ration and sweet potato leaves. Both ratios were found to be equally efficient in converting feeds to flesh.

Feed Cost to Produce a Kilogram Gain

The feed cost to produce a unit gain in weight of native chicken is presented in Table 5. Cost of commercial feeds was Php27.00 per kg while sweet potato leaves was Php10.00 per kg based on the labor spent for gathering and preparation. Analysis of variance showed no significant on the costs between the treatments. Higher numerical leaves with a mean of Php134.51. However, the difference of Php6.13 is still considered as non significant. This numerical difference is due to the feeding scheme done where



cost was incurred from the birds given commercial ration only with a mean of Php140.64 and a lower feed cost on the birds given commercial ration and sweet potato

Table 4. Feed conversion ratio

TREATMENTS	FEED CONVERSION RATIO	
	(AS FED)	(DM BASIS)
Commercial feeds	5.75	4.93
Commercial feeds + sweet potato leaves	5.21	3.95

Means with the same superscript are not significantly different ($P \geq 0.05$) LSD

Table 5. Feed cost to produce a unit gain in weight

TREATMENTS	FEED COST (Php)
Commercial feeds only	140.64
Commercial feeds + sweet potato leaves	134.51

Means with the same superscript are not significantly different ($P \geq 0.05$) LSD

commercial feeds in treatment 0 is given *ad libitum* while commercial feeds and watercress in treatment 1 is given on a restricted time.

Morbidity and Mortality

There were no incidents of mortality or morbidity among the birds from the start up to the end of the study. Even the birds were just given commercial multivitamins only at the first week of the study; they were able to maintain good health despite fluctuations on the environmental temperature during the conduct of the study that could have made the



birds prone to diseases. The non incidence of mortality or morbidity proves the hardiness of native chicken and their resistance to diseases.

Return on Investment

The returns on investment in raising native chicken in the different treatments are presented in Table 6 and details on the cost and return analysis are shown in Appendix Table 22. Sales from birds fed with commercial ration and chopped sweet potato leaves produced a higher net profit of Php775.00 with a ROI of 14.83%. On the other hand, birds fed with commercial ration had a lower net profit of Php650.00 and a ROI of 12.15%. Statistical analysis revealed that there were no significant differences on the ROI of the two treatments.

Table 6. Return on investment

TREATMENTS	TOTAL COST (Php)	TOTAL SALES (Php)	NET INCOME (Php)	ROI* (%)
Commercial feeds	5350.00	6000.00	650.00	12.15
Commercial feeds + sweet potato leaves	5225.00	6000.00	775.00	14.83

* Means with the same superscript are not significantly different ($P \geq 0.05$) LSD



SUMMARY, CONCLUSION, AND RECOMMENDATION

Summary

The study was conducted to determine the effect of commercial feeds and sweet potato leaves on the growth performance of native chickens. Specifically, it was conducted to determine the growth performance of native chicken in terms of gain in weight, feed consumption, feed conversion ratio, morbidity and mortality, and profitability of raising native chicken given commercial feed and sweet potato leaves. This study was conducted from October 2012 to January 2013 at the BSU Poultry, Balili, La Trinidad, Benguet.

A total of thirty birds were used in the study grouped into two treatments following Randomized Complete Block Design (RCBD). Each treatment had three blocks which 5 birds per block making a total 15 birds per treatment. Birds under the control treatment were given commercial feeds *ad libitum* while birds in treatment 1 were given commercial feeds and sweet potato leaves on a restricted time. All the birds were confined throughout the study and were subjected to the same care and management except for the kind of ration given.

After 82 days of feeding trial, the birds were able to gain a mean of 1.140 kg from a mean initial weight of 0.246 kg to a mean final weight of 1.429kg. Throughout the study, each bird consumed a mean of 4.99kg (DM basis) with a mean daily gain of 0.014kg. Statistical analysis showed no significant differences between the two treatments in terms of initial weights, final weights, feed intake, feed conversion ratio, dry matter intake and return on investment. It means that the bird's performances are comparable to each other in the above parameters.



Conclusion

Based on the results of the study, it could be concluded that giving commercial feeds and sweet potato leaves on a restricted time to native chickens will result to the same growth performance as the native chickens given *ad libitum* commercial feeds.

Recommendation

Based on the findings of the study, it is recommended that commercial feeds and sweet potato leaves can be fed to native chickens following the restricted time of giving feeds to minimize wastage, hence, increasing profit. It is also recommended that other studies will be conducted on the use of sweet potato leaves in combination with other cheaper base feeds such as rice bran and cracked rice (*pegpeg*).



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