BIBLIOGRAPHY

MAYANGAO, MARICEL A. MARCH 2012. Growth Perforfance of Birds Fed With Commercial Ration Supplemented With Diced Raw Chayote Fruit.Benguet State University, La Trinidad, Benguet.

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ABSTRACT

The study was conducted to determine the effect of supplementing rations of birds with diced raw chayote fruit on the gain in weight, feed conversion ratio, mortality and morbidity rate and the return on investment.

A total of 128 heads of 30-day-old birds were randomly distributed into four treatments and replicated four times with eight birds per replication. The treatments were pure commercial ration, 25g diced raw chayote/day + commercial ration and 50g diced raw chayote/day + commercial feeds and 75g diced raw chayote fruit/ day + commercial feeds. The experimental rations were given to the birds starting at day 30 to day 45, a period of 15 days.

Results of the study revealed no significant differences among the treatments in terms of final weight total and daily gain in weight and feed conversion ratio. The average daily gain in weight of birds from 30 days of age to 45 days of age was 20.94g with an average FCR of 2.49.

INTRODUCTION

The current increasing demand for poultry meat can hardly be met by poultry raisers because of insufficient production caused by a variety of factors including high cost of production. One way to reduce production cost is to supplement animal diets with cheap locally available feedstuffs. Since poultry raisers are experiencing high cost of feeds, researchers are now seeking some materials that can be used as feed supplement, chayote could be one.

According to James *et al*., (2010), feed cost comprises about two-thirds of the total cost of producing eggs and meat from birds. Therefore, all management practices including feeding practices must be assigned to meet the needs of birds and still allow room for profit.

In the publication of Modern Agriculture, Benguet animal raisers even in lowlands found out that hogs fed twice a day with diced cooked chayote fruit as feed supplements were healthy. In Atok, Benguet, some farmers feed their native birds with raw chayote fruit as feed supplement. If both cooked and raw chayote fruit are fed to animals like hogs and native birds, then chayote could be given to birds.

Birds are free-range type of birds which is fast becoming popular among commercial and backyard raisers in Benguet. These meat type birds can graze around the field or backyard, eating grass, leaves and other natural feedstuffs (Regional Agriculture and Fisheries Information Division, 2006)

The result of this study was added to the pool of information regarding poultry feeding particularly of the free range type of birds. Information generated from this study can be used by poultry raisers, researchers, and students as guide for their production and research endeavors.

This study was conducted to determine the effect of supplementing the diet of birds with diced raw chayote fruit on the growth performance. Specifically, this research aimed to:

1. determine the effect of supplementing diets of birds with diced raw chayote fruit on the , gain in weight, feed conversion ratio, mortality and morbidity rate and
2. determine the return on investment of raising feeding birds with diets supplemented with diced raw chayote fruit.

This study was conducted at the Benguet State University Poultry Project, La Trinidad, Benguet from January to March 2012.

REVIEW OF LITERATURE

Francisco (1992), Bautista and Mabesa (1993) stated that the reason why poultry and livestock farmers give daily feed supplements and other substances to animals is to minimize production cost, improve feed efficiency and enhance animal appetite. The practical farmer then makes use of locally available feedstuffs that can be produced at minimal cost.

Chayote (*Sechium edule*) belongs to family cucurbitaceae. It is an edible plant which is originally native in Mexico and Central American during Pre-Colombian time. It was introduced in South America during the 18th and 19th centuries. It is a tropical vine and is the only genus which contains only one seed. The leaves of the plants are hairy, broad and triangular. The flowers are yellowish, five-petaled and located in the axils. The fruit is light green and pear-shaped but somewhat wrinkled (Hector Rodriguez, 2006). According to the Philippine Food Composition (1997), the edible part of chayote has lower fiber, protein and vitamin content than other plants. However, the calorie and carbohydrate content are high chiefly from the young shoots, tubers and seed. On the other hand, micro and macro nutrients supplied by the fruit are adequate. The fruit, particularly the seeds, are rich in amino acids such as aspartic acid, glutamic, phenylalamine, glycine, histidine, isoleucine and methionine and proline, serine, tyrosine, threonine and valine. Specifically, Table 1 shows the calories/nutrient content of edible portion for both raw and cooked fruits of chayote per 100 grams.

Table 1. The calorie / nutrient content per 100 grams of edible portion of chayote both raw and cooked.

CONTENTS	CHAYOTE FRUIT (RAW)	CHAYOTE FRUIT (COOKED)
Edible portion (%)	85	100
Water (g)	94.7	96.0
Energy (cal)	21	16
Protein (g)	0.4	0.3
Carbohydrates (g)	4.6	3.5
Diet Fiber (g)	(1.1)	0.7
Calcium (mg)	24	2.5
Total Vitamin A (ug)	6	3
Iron (mg)	0.4	0.4
Thiamine (mg)	0.02	0.01
Riboflavin (mg)	0.02	0.01
Niacin (mg)	0.4	0.3
Ascorbic acid (mg)	15	10
Fat (g)	0.1	0.1
Phosphorus (mg)	10	10

Source: The Philippine Food Composition Table, (1997) as cited by Payangdo (2008)

In addition to nutrient composition, Saade (1998) of the National Herbarium of Mexico, Mexico City stated that infusion of the fruit is used to alleviate problems in urine retention.

MATERIALS AND METHODS

The materials and equipment used in this study were 128 heads day- old Birds birds, commercial feeds, diced raw chayote fruits, disinfectants, vaccines, 100-watt electric bulbs, newspaper sheets, waterers, feeders, brooding-rearing cages, weighing scale and records books.

Methodology

Care and management. Before the start of the study, all brooders, feeders, waterers were cleaned and disinfected to prevent the occurrence of parasites and diseases. Strict hygiene and sanitation was followed at all times. Newspaper sheets were spread on the floor to prevent the chicks from tripping on the floor and to serve as receptacle for the feeds of the chicks for the first few days and help conserve the heat inside the brooder. The lights were switched- on two hours before the chicks arrived. Before transportation, the chicks were given water to drink to prevent stress. Brown sugar was added to the water at a rate of one percent or about two tablespoon per gallon of water to rehydrate the chicks faster. Within two hours of arrival, the chicks were given food and water.

Experimental design and treatments. After 30 days of brooding, the birds were weighed for their initial weight and distributed at random to four-treatment groups following the completely randomized design (CRD). Each treatment was replicated four times with eight birds per replicate having a total of 128 birds.

The different treatments were as follows:

T_0 = No chayote supplement

T_1 = Commercial feeds + 25grams of diced raw chayote fruit/bird/day

T_2 = Commercial feeds + 50grams of diced raw chayote fruit/bird/day

T_3 = Commercial feeds + 75grams of diced raw chayote fruit/bird/day

The birds in all treatment were subjected to the same care and management in all aspects except on the level of diced raw chayote fruit added to their ration. The birds assigned to the control treatment were given pure commercial feeds, while the birds assigned to the other treatments were given 25g of diced raw chayote fruit + commercial feed, the birds assigned other treatments were given 50g of diced raw chayote + commercial feeds, and the other birds assigned to other treatments were given 75g of diced raw chayote fruit + commercial feeds. The feed supplements were given to the birds twice a day, 6:00 in the morning, and 4:00 in the afternoon. For each treatment, half of diced raw chayote fruit were given at 6:00 in the morning and the half was given at 4:00 in the afternoon. During the first week, the birds were given pre-starter ration, followed by starter ration for the next two weeks, and then finisher ration from the third week of age up to forty-five days. Fresh water was provided to the birds.

Preparation of the chayote fruit. The chayote fruit were collected from the farm of chayote growers in Bineng, La Trinidad, Benguet. Chayote fruit were peeled off and were cut into small pieces measuring approximately 2-3mm thick.

Data gathered were as follows:

Initial weight of the chicks (kg). This was taken by weighing the initial weight of the birds at the start of the study or at 30 days of age.

1. Final weight of the chicks (kg). This was taken by weighing the final weight of the birds at 45 days of age.

2. Feed left over (kg). This refers to the amount of feed not consumed by the experimental birds from day 30 up to day 45.

3. Number of sick birds. This refers to the number of birds that sick from day 30 up to day 45.

4. Number of birds that died. This refers to the number of birds that died from day 30 up to day 45.

5. Cost of production. This includes the cost of purchased materials that were used in the study.

From the above data, the following were computed:

1. Daily gain in weight of the birds (kg). This is the difference between the final weights and the initial weights of the experimental birds divided by the number of days of the experimental period.

2. Total feed consumption (kg). This was obtained by adding the total amount of feed consumed by the birds from day 30 up to day 45.

3. Feed conversion ratio. This was obtained by dividing the total feed consumption by the total gain in weight of the birds for the experimental period.

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

1. Mortality rate (%). This was computed by dividing the number of dead birds by the total number of birds then multiplied by 100.

2. Total cost of production. This was obtained by computing the total of the costs of each item used during the study period.

3. Gross income. This was obtained by multiplying the final weight of the birds by the price per kg live weight.

4. Net profit. This was obtained by subtracting the gross income by the total expenses.

5. Return on investment (ROI). This was computed by dividing the net profit by the total cost of production then multiplied by 100.

Feed cost per kg of gain. This was obtained by multiplying the feed conversion ratio by feed cost per kg.

RESULTS AND DISCUSSION

Initial Weight and Final Weight of the Birds

The initial weight and final weight of the birds taken at day 30 and day 45, respectively is shown on Table 1. Statistical analysis showed no significant differences in the initial weight of birds among treatments. The average initial weight of birds was 560g at 30 days of age. This indicates that the experimental units were homogenous at the start of the study.

No significant differences were also observed in the final weight of birds among treatments. The average final weight of birds given pure commercial feeds was 941.5g, those birds given 25g of diced fresh chayote fruit per kg commercial feeds was 863.44g, 50g of diced fresh chayote fruit per kg commercial feeds was 827.50g and those birds given with 75g of diced fresh chayote fruit per kg commercial feeds was 860.94g respectively. This implies that supplementing diced raw chayote fruit at the rate of 25g, 50g and 75g had no effect on the final weight of the birds taken at the 45 days of age.

Table 1. Initial weight at 30 days and final weight at 45 days of age of birds

TREATMENT	BODY WEIGHT (g)	
	INITIAL	FINAL
Pure Commercial Feeds	548.750[a]	941.25[a]
25g diced raw chayote fruit/kg commercial ration	566.562[a]	863.44[a]
50g diced raw chayote fruit/kg commercial ration	550.094[a]	827.50[a]
75g diced raw chayote fruit /kg commercial ration	572.969[a]	860.94[a]

Means with the same letter are not significantly different at 5% level of DMRT.

Gain in Weight of Birds

Table 2 presents the total gain in weight and daily gain in weight of birds from 30 days to 45 days of age. Statistical analysis showed no significant differences between the treatments. The total gain in weight of birds given pure commercial feeds was 392.000g and those given diced raw chayote fruit with a rate of 25gper kg of commercial feeds was 392g, those given with 50g of diced fresh chayote fruit was 278.844g and those given with 75g of diced raw chayote fruit per kg of commercial feeds was 287.969g per kg of commercial feeds respective. Birds gained an average of 319.61g for the 15 days with an average daily gain of 20.94g per day. This indicates that supplementing commercial ration with diced raw chayote fruit at the rate of 25g, 50g or 75g per day had no effect on the gain in weight of birds.

Table 2. Gain in weight of birds for 15 days

TREATMENT	GAIN IN WEIGHT (g)	
	TOTAL	DAILY
Pure Commercial Ration	392.000[a]	26.17[a]
25g diced raw chayote fruit/kg commercial ration	319.625[a]	19.70[a]
50g diced raw chayote fruit/kg commercial ration	278.844[a]	18.59[a]
75g diced raw chayote fruit/kg commercial ration	287.969[a]	19.20[a]

Means with the same letter are not significantly different at 5% level of DMRT.

Feed Intake of Birds

The total and daily intakes, dry matter basis of french chickens in different treatments taken from day 30 to day 45 are presented in Table 3. Dry matter intakes were computed based on 92.60% dry matter in commercial feeds and 5.73% dry matter in chayote. The birds in all replicate per treatments were given the same amount of feeds. The average daily feed intake, dry matter basis of birds given pure commercial feeds was 839.19g, those given 25g of diced raw chayote fruit per kg of commercial feeds was 758.10g, those birds given with 50g diced raw chayote fruit per kg of commercial feeds was 782.80g, and those given with 75g diced raw chayote fruit per kg of commercial feeds was 680.69g. Likewise, the average daily feed intake, Dry matter basis of birds given pure commercial feeds was 55.95g, those given with 25g of diced raw chayote fruit per kg of commercial feeds was 50.95g and those birds given 75g diced raw chayote fruit per kg of commercial feeds was 45.38g respectively. The total feed intake and the average daily gain in weight of birds were computed as dry basis. This indicates that supplementing 25g, 50g and 75g of diced raw chayote fruit had no effect on the feed intake of the birds from day 30 to day 45.

Feed Conversion Ratio

Feed conversion ratios of birds fed from 30 days to 45 days of age were shown in Table 4. Statistical showed no significant differences between the treatments. The feed conversion ratio of birds given pure commercial ration is 2.16 and those given commercial ration supplemented with 25g of diced raw chayote fruit was 2.61, those given 50g of diced raw chayote fruit was 2.72 per kg commercial feeds and those given with 75g diced raw chayote fruit were 2.48 per kg commercial feeds respectively. This

implies that supplementing commercial ration at the rate of 25g, 50g and 75g of diced raw chayote fruit had no effect on the efficiency of feed utilization in French chicken.

Feed Cost per Kilogram
Of birds produced

The feed cost per kg gain of French chicken produced raised from 30 days to 45 days of age is shown in Table 5. The average feed cost / kg gain of birds given pure commercial feeds is Php. 67.43 and those given ration with ratios supplemented with 25g of diced raw chayote fruit is Php. 76.33, those given ratios with 50g of diced raw chayote fruit / day was Php. 80.19, and those given 75g of diced raw chayote fruit was Php. 61.62.

Table 3. Feed intake of birds, dry matter basis

TREATMENT	CHAYOTE + CF INTAKE	
	TOTAL	DAILY
Pure Commercial Ration	839.19[a]	55.95[a]
25g diced raw chayote fruit/kg commercial ration	758.10[a]	50.95[a]
50g diced raw chayote fruit/kg commercial ration	782.80[a]	52.19[a]
75g diced raw chayote fruit/kg commercial ration	287.969[a]	19.20[a]

Means with the same letter are not significantly different at 5% level of DMRT.

Table 4. Feed conversion ratio of birds

TREATMENTS	FCR
Pure Commercial Feeds	2.16[a]
50g diced raw chayote fruit per kg of commercial ration	2.61[a]
50g diced raw chayote fruit per kg of commercial ration	2.72[a]
75g diced raw chayote fruit per kg of commercial ration	2.48[a]

Means with the same letter are not significantly different at 5% level of DMRT.

Return on investment

The cost and return analysis per treatment is shown in Table 6. The return on investment of birds given pure commercial ration is 19%, those given rations supplemented with 25g, 50g, or 75g diced raw chayote fruit/day were 10%, 9.35% 5.35%, respectively.

Table 5. Feed cost per kilogram of birds produced (Php)

TREATMENT	FEED COST / KG OF FRENCH CHICKEN (PhP)
Pure Commercial Feeds	67.43
25g diced raw chayote fruit per kg of commercial ration	76.33
50g diced raw chayote fruit per kg of commercial ration	80.19
75g diced raw chayote fruit per kg of commercial ration	61.62

Means with the same letter are not significantly different at 5% level of DMRT.

Table 6. Return on Investment

TREATMENT	TOTAL SALE (Php)	TOTAL COST OF PRODUCTION (Php)	NET INCOME (Php)	ROI (%)
T_0	5, 307.930	4, 423.750	496.375[a]	19
T_1	5,459.000	4, 962.625	884.180[a]	10
T_2	5, 248.500	4, 799.880	448.620[a]	9.35
T_3	5, 127.630	4867.200	260.430[a]	5.35

Means with the same letter are not significantly different at 5% level of DMRT.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study was conducted to determine the effect of diced raw chayote fruit on the, gain in weight, feed conversion ratio, mortality rate and morbidity rate of diced raw chayote fruit as fed supplements. This was conducted at the Benguet State University Poultry Project, La Trinidad, Benguet from January to March 2012.

One hundred twenty-eight heads of 30-day-old birds were distributed at random employing the completely randomized design (CRD) to four treatments with four replications. The treatments were pure commercial ration, 25g diced raw chayote fruit/day + commercial ration, 50g diced raw chayote fruit/day + commercial ration and 75g diced raw chayote fruit/day + kg commercial ration.

Statistical analysis showed no significant differences in the initial weight, final weight, and average daily gain in weight, and feed conversion ratio (FCR) of french chicken raised from 30 day to 45 days of age. The mean initial weight of the experimental birds was 559.59g. The final weight was 873.28g. The average daily gain in weight of birds was 20.94g with a FCR of 2.49.

The return on investment (ROI) was not subjected to statistical analysis but results showed that the birds given pure commercial ration had a higher ROI of 19% compared to those given with 25g, 50g of diced raw chayote fruit and 75g diced raw chayote fruit per day + commercial ration of 10%, 9.3% and 5.35%, respectively.

Conclusion

From the result of the study, supplementing commercial ration with 25g, 50g and 75g diced raw chayote fruit/day had no effect on the growth performance of french chicken.

Recommendation

Based on the result of the study, giving diced raw chayote fruit as feed supplement is not recommended.

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