BIBLIOGRAPHY

TALABIS, ROLDAN C. APRIL 2012. Carcass Characteristics of Broilers Fed Diets Supplemented with Termite Nymph (*Reticulitemes flavipes*). Benguet State University, La Trinidad Benguet.

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ABSTRACT

This study was conducted to determine the effect of termite nymph on the carcass characteristics of broilers. Specially, it aimed to find out the effect of termite on the dressing recovery of broilers under La Trinidad, Benguet. Also to determine the quality of carcass produced from broilers fed with termite through nutritional analysis (DOST).

Statistical analysis showed that there are no significant differences among the dressing recovery from the birds. This could be because the numbers of birds and replication or the amount of termites given were not enough to produce significant results. This shows that using termite as feed supplement did not affect the dressing percentage of the birds, as well as the lean, bone and fat.

Nutritional analysis (DOST) showed that treatment 1 fed with 10g of termite/kg of commercial feeds contains the highest crude fat and crude protein. On the other hand, treatment 3 fed with 20g of termite/ kg of commercial feeds contains the lowest crude fat and crude protein.

It is therefore concluded that the carcass characteristics of broiler were not affected by the incorporation of termite nymph in the feed or may be the concentration is less in amount to affect the carcass of the broilers.

INTRODUCTION

Chicken broiler production is the most progressive animal enterprise in our country today. The poultry industry in fact began as a backyard enterprise but has shifted to the formation of very large integrated contract farming operations. The growth of tile poultry industry has indeed impressive but its problem including inefficient management and the prevalence of many destructive disease and parasites cannot be ignored.

People who are meat eaters look for ways to reduce the amount of fat in their meals. Consumers prefer to buy chicken meat because it provides the complete protein and of all meats is one of the lowest in calories, fat and saturated fat. The structure of humans and animals is built on protein.

Chicken meat is also one of the consumers most favorite foods because it is wholesome, versatile and easy to prepare especially when it is organically raised. Most consumers look a food which is very nutritious even it is expensive only to have a good diet. Chicken fits easily into today's preference for healthy living.

This research aims at producing a reference in the use of termite as feed additive and it hopes to promote the use of natural products in improving the carcass characteristics of broilers. This was conducted also to discourage the use of inorganic supplement in food animals if it is proven effective.

This study generally aims to determine the effect of termite on the carcass characteristics of broilers to find out the effect of termite on the dressing recovery of broiler under La Trinidad, Benguet and to determine the quality of carcass produced from broilers fed with termite through nutritional analysis (DOST)

The experiment used a total of 12 broilers which were subjected to 35 days feeding period. Carcass evaluations were done at the Department of Animal Science (DAS) room while nutrient content analysis was done at the DOST-CAR Regional Standards and Testing Laboratory at La Trinidad, Benguet on December 2011.

REVIEW OF LITERATURE

Gullan and Grandstone (1994) stated that if you do not relish the prospect of eating insects yourself, then perhaps the concept of insects as a protein source for domesticated animals is more acceptable. The value of insects as feed for fish, poultry, pigs and farm-grown mink certainly is recognized in China, where feeding trials have that insect derived diets can be cost-effective alternatives to more conventional fishmeal diets. Clearly insects can from part of the nutritional base for people and their domesticated animals.

Some insects are edible. In fact, most insects are edible but there are few species that are especially palatable, nutritious and easily obtainable. Many species of insects are lower in fat, higher in protein and have a better feed to meat ratio than beef, lamb, pork or chicken. Insects are easy to rise. There is no manure forking. No hay bale lifting. No veterinary bills. You can raise them in an apartment without getting complaints (Grimaldi and Engel, 2005).

According to Romoser and Stoffolano (1998) insects actually have a high nutritional value, being quite rich in protein and lipids, and may therefore be a very important supplement to the diets of otherwise vegetarian people.

Although of small size, insects, because of their prodigious number, probably exceed in weight all other animals matter on the land areas of the earth. This great mass of material possesses genuine food value. Chemical analyses of white grubs and May beetles, for example, have shown that these insects compare favorably with corn in food value. Turkeys, hog, and other domestic animals will often fatten on insects. It has been said that insects make up, on the average, about two-third of the food of our common land birds (Metcalf and Flint, 1932).

Coma (2000) mentioned that nutrients may have a significant effect on certain attributes of meat quality. Meat quality is a complex without a single definition. Fresh meat attributes such colors, quality of fats, tenderness, juiciness and flavor are essential in order to drive the purchase and assure consumers fidelity. In addition, we must not forget the interrelation with other elements of production process like genetic handling and slaughter.

According to Paris (1998) a poultry carcass should produce high yield of meat of good nutritional value and eating quality. As commodity, it has to meet the requirement of the costumer in terms of attractive color and appearance of the product offered. Also include the nutritive and the smell and especially free from chemical residues.

Also when compared with other meat, chicken has slightly higher protein content but the total fat content is no more than 20% of that of other meat. The saturated fatty acid content is 50% that of other meat and level of polyunsaturated fats slightly higher, thus placing chicken favorable with respect to human nutrition (Paul and Southgate, 1978).

To produce a good quality of meat, it is best to use organic feeds which are formulated ration without using synthetic chemicals. Formulated ration such as organic feeds are economical than commercial feeds. Organic chicken refers to animals reared in semi out-door conditions and feed diets without using chemicals (Gill, 2000).

METHODOLOGY

Materials

The different materials used in the study are as follows: 12 heads of 45-day-old broiler from a previous growth study feed with termite, knives, and containers, weighing scale, digital camera, record book and Ziploc bags.

The birds should have more or less weight. Three birds were taken from each of the four treatments from the previous study. The termites were gathered in La Union from the forest and from their natural habitat. The termite were cleaned from the soil particles and mixed to the commercial feeds on specified amounts as designated in the treatment. Each bird represents one replication making a total of three replicates per treatment. The treatments administered to the birds are as follows:

T_0- control; CF

T_1- 10g termite nymph per kg CF

T_2- 15g termite nymph per kg CF

T_3- 20g termite nymph per kg CF

Carcass Yield Evaluation

The dressed bird was placed on the pan of the weighing scale and weight was recorded in kilograms. The carcasses and abdominal color were observed using Roche color fan. Abdominal fats of broiler belonging to the different treatments also weighed and recorded.

Data Gathered

The following parameters were gathered from the study:

1. Slaughter weight (kg). This was the weight of the bird before slaughter time.

2. Dressed weight (kg). This was the actual weight of slaughter bird after plucking the feathers, head, feet and entrails off.

3. Skin color. This was compared using Roche color fan.

4. Abdominal fat (g). This was the weight of the abdominal fat.

5. Color of abdominal fat. This was compared using Roche color fan.

6. Dressing percentage (%). This was obtained dividing the carcass weight by the slaughter weight multiplied by 100%.

7. $\%\ \text{Lean} = \frac{\text{Wt. of lean \#}}{\text{Dressed Wt.}} \times 100\%$

8. $\%\ \text{Bone} = \frac{\text{Wt. of bone \#}}{\text{Dressed Wt.}} \times 100\%$

9. Lean to Bone ratio. This was computed using the formula: $\frac{\%\ \text{lean}}{\%\ \text{bone}}$

10. Nutritional analysis (DOST).

11. Other observations.

Data Analysis

Data was analyzed using the analysis of variance for Completely Randomized Design and Treatment means were compared using Duncan's Multiple Range Test (DMRT).

RESULT AND DISCUSSION

Slaughter Weight, Dressed Weight and Dressing Percentage

Table 1 presents the slaughter weight of the birds after 8 hours of fasting. Statistical analysis found no significant differences between treatments. This may prove that although termite supplementation did not enhance slaughter weight, it also did not affect it unfavorably.

The dressed weight and dressing percentage of the birds from the different treatments are likewise presented in Table 1. There are no significant differences among the dressed weight and dressing recovery from the birds. This shows that using termite as feed supplement did not affect the dressing percentage of the birds.

Skin Color

After dressing, the carcasses were displayed on the table and observed for skin color. The skin of the carcasses is more or less of the same color of pale yellow based on Roche color fan (Figure 1 to 4). This means 10-20g of termite did not affect the skin color of the sample birds.

Weight of Abdominal Fat

Table 2 presents the abdominal fat. The result revealed that the termite nymph added into the bird's rations did not affect the weight of the abdominal fat of the dressed broilers under the different treatments. This shows that fat deposition is independent from diet or that the amount of termite nymph was not enough to cause any significant effect.

Figure 1. Comparing the skin color of treatment 0 with Roche color fan

Figure 2. Comparing the skin color of treatment 1 with Roche color fan

Figure 3. Comparing the skin color of treatment 2 with Roche color fan

Figure 4. Comparing the skin color of treatment 3 with Roche color fan

Weight of Bone

Table 3 presents the weight of bone expressed as percentage of dressed weight. Statistical analysis proves that termite nymph has no significant effect on the bone yield of the dressed birds. This may suggest that whether the birds were fed with commercial feeds only or with termite, the weight and percentage of bone is literally the same.

Table 1. Slaughter weights, dressed weights and dressing percentage of the sample birds

TREATMENT	SLAUGHTER WEIGHT (kg)	DRESSED WEIGHT (kg)	DRESSING PERCENTAGE
Commercial feeds only	2.37[a]	1.85[a]	78.05[a]
10g termite/ kg of CF	2.23[a]	1.69[a]	75.69[a]
15g termite/ kg of CF	2.33[a]	1.83[a]	77.92[a]
20g termite/ kg of CF	2.87[a]	2.20[a]	76.63[a]

Means with the same letter superscript are not significant different

Table 2. Weight of abdominal fat of the sample birds

TREATMENT	ABDOMINAL FAT (g)
Commercial feeds only	23.33[a]
10g termite/ kg of CF	13.33[a]
15g termite/ kg of CF	21.33[a]
20g termite/ kg of CF	16.00[a]

Means with the same letter superscript are not significant different

Weight of Lean

Table 4 presents the weights and percentage of lean. The birds, according to statistical analysis, were able to deposit lean that is more that 50% of their dressed weight. This shows that also that lean development in the experimental animals was not appreciably affected by feeding termite nymph.

Table 3. Weight of bone, expressed as percentage of dressed weight

TREATMENT	DRESSED WEIGHT	WEIGHT OF BONE	% BONE
Commercial feeds only	1.778[a]	403.33[a]	22.11[a]
10g termite/ kg of CF	1.545[a]	371.67[a]	22.09[a]
15g termite/ kg of CF	1.347[a]	383.33[a]	21.61[a]
20g termite/ kg of CF	2.295[a]	473.33[a]	21.69[a]

Means with the same letter superscript are not significant different

Table 4. Weight of lean, expressed as percentage of dressed weight

TREATMENT	DRESSED WEIGHT	WEIGHT OF BONE	% LEAN
Commercial feeds only	1.778[a]	1120.00[a]	60.537[a]
10g termite/ kg of CF	1.545[a]	950.00[a]	56.263[a]
15g termite/ kg of CF	1.347[a]	1028.33[a]	55.627[a]
20g termite/ kg of CF	2.295[a]	1255.00[a]	56.757[a]

Means with the same letter superscript are not significant different

Lean to Bone Ratio

Table 5 presents the lean to bone ratio. This parameter accounts for the amount of lean deposited on a certain amount of bone. The table shows that the lean: bone ratio among the treatments did not vary and the range is from 2.55 to 2.75 lean for every kilogram of bone.

Nutritional Analysis

Table 6 presents the nutritional analysis that shows that the carcass from the birds fed 10g termite/ kg of commercial feeds had crude fat values of 0.37. The carcass from birds fed commercial feeds had a crude fat value of 0.21 while the carcass from the birds fed with 15g termite nymph had a crude fat value of 0.12. Interestingly, the carcass sample taken from the birds fed 20g termite nymph had 0 crude fat content. On the other hand, the carcass from the birds fed 10g termite/ kg of commercial feeds had crude protein values of 25.67. The carcass from birds fed commercial feeds had a crude protein value of 25.47 while the carcass from the birds fed with 15g termite nymph had a crude protein value of 25.24. The carcass sample taken from the birds fed 20g termite nymph had 25.19 crude protein content.

Table 5. % Lean, % bone and lean to bone ratio of the sample birds

TREATMENT	% LEAN	% BONE	LEAN TO BONE RATIO
Commercial feeds only	60.537[a]	22.11[a]	3.21[a]
10g termite/ kg of CF	56.263[a]	22.09[a]	3.12[a]
15g termite/ kg of CF	55.627[a]	21.61[a]	3.17[a]
20g termite/ kg of CF	56.757[a]	21.69[a]	3.13[a]

Means with the same letter superscript are not significant different

Table 6. Nutritional analysis (DOST) of the carcass from sample birds

TREATMENT	CRUDE FAT % w/w	CRUDE PROTEIN % w/w
Commercial feeds only	0.21	25.47
10g termite/ kg of CF	0.37	25.67
15g termite/ kg of CF	0.12	25.24
20g termite/ kg of CF	0	25.19

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study was conducted to determine the carcass characteristics of broilers fed diets supplemented with termite nymph.

Specially, the study aimed to find out the effect of termite on the dressing recovery of broiler under La Trinidad, Benguet and to determine the quality of carcass produced from broilers fed with termite through nutritional analysis (DOST).

The birds used in the study were 12 heads of broiler subjected to the following treatments for 45 days: T_o (commercial feeds); 10g termite nymph/ kg of commercial feeds; 15g termite nymph/ kg of commercial feeds; 15g termite nymph/ kg of commercial feeds. After the trial feeding, the sample birds were selected for carcass evaluation.

The result of the nutritional analysis showed that the birds fed with 10g of termite/ kg of commercial feeds contains 0.37% crude fat and 25.67% crude protein. On the other hand, those birds fed with 20g of termite/ kg of commercial feeds contains 0% crude fat and 25.19% crude protein.

Conclusion

It is therefore concluded that the carcass characteristics of broiler were not affected by the incorporation of termite nymph because of non-significant differences in the results.

Recommendation

Based on the study, it is therefore recommended that termite nymph may be a good feed supplement for broilers as proven by the growth study. As for the result of carcass evaluation, the non-significant result may prove that termite nymph supplement is safe as no deleterious effects were seen.

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