

TERMITES AS POSSIBLE ANIMAL PROTEIN SUPPLEMENT FOR JAPANESE QUAIL (*Coturnix Coturnix japonica*) CHICKS FEED

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ABSTRACT

Termites (sclerotized *Macropteron*s) collected during the rainy season and were divided into two portions; one was sun dried and the other portion roasted. They were analysed for their proximate compositions and possible use as replacement for fishmeal in quail chicks diet. An experimental diet with roasted termite as a source of animal protein was fed to day old quail chicks for 3 weeks alongside a control group fed with commercial chick starter feed. Results obtained showed that sun dried and roasted termites contains 42.3% and 47.34% crude protein (C.P.) respectively. There was a general increase in feed intake, net weight gain and feed efficiency, as the quails grow older in the groups. There was no significant difference ($P < 0.05$) in net weight gain and feed efficiency in quail chicks fed experimental diet when compared to those fed with commercial chick mash. It may be possible to use termite as possible replacement for fishmeal in quail chicks' diet. Further studies will need to be carried out to ascertain the amino acids profile and other benefits of termites.

Key words: Termites, Animal protein, Japanese quail, Chicks.

Introduction

In an attempt to argument the animal protein for human consumption, quail were introduced in Nigeria in 1992 (Haruna, *et al.*, 1997). They are highly prolific with short generation interval and less susceptible to diseases. They therefore facilitate to bridge the gap for other animal products to be available on the table for human consumption. Animal feeds, especially in the tropic, constitute about 80% of total cost of production in the Poultry Industry. Fishmeal because of its richness in lysine content (4.6) is an important constituent of poultry feed mixes. But the importance of this feed stuff has been on the decline in many countries including Nigeria because of its relatively high cost, non availability and at times low quality because of adulteration by feed millers (Fadiyimu, *et al.*, 2003). This necessitates the search for alternatives to fishmeal for use in poultry feed.

Brown and Davidson (1977) stated that in the wild, Quail were known to feed mainly on insects, grains, seeds, and juice obtainable from some wild fruits plants.

Termites (*macrotermes* sp) are small, soft-bodied social insects which have the unique ability of digesting cellulose and synthesizing essential amino acids from non protein nitrogen (Fadiyimu, *et al.*, 2003). Termites as insects are observed to appear in mass/swamps during the rainy season mostly from beginning of rain to early September once a year. A brood of winged male and female Termites (nuptial period) are produced; these are fully formed reproductive individual, called sclerotized macropteron or first reproductive caste. They leave the nest (termitearia) in swamps, disperse, mate and form colonies (Herbert, *et al.*, 1982). Many migratory insectivorous birds as well as anteaters, Pangolins and ant Bears feed

mainly on these termites. They are also commonly eaten by rural dwellers in some communities in West Africa (Lamb, 1974; Fadiyimu, *et al.*, 2003). The purpose of this work was to determine whether Termites could be used as animal source of protein supplement for growing Japanese quail birds.

Materials and methods

Termites

Termites were collected during the rainy season in June. They were divided into two portions, one was sun dried and the other was roasted in a dry air oven at 60°C. Nutrient composition of both the sun dried and roasted Termites were determined according to A.O.A.C (1990).

Standard and Experimental Feeds.

Standard feed, chick starter was obtained from Dagwom Farms of NVRI Vom and used as control feed.

Experimental feed composed of roasted Termite replacing fishmeal at 100% level as sole source of protein. Both feeds (standard and experimental) were analysed for their proximate composition (A.O.A.C., 1990).

Experimental Feeding

Ninty (90) day old unsex quail chicks obtained from NVRI Poultry Farm were randomly allotted to two groups A and B each having forty five (45) chicks respectively.

Group A was fed with standard feed and serve as control while group B was fed experimental feed.

Both groups were fed and given water adlibitum for three (3) weeks.

Records of weekly feed intake and weekly weight gain were taken. Feed efficiency was also calculated. Data obtained was subjected to Analysis of variance (ANOVA), SAS, (1987).

Result and Discussion

The result of proximate composition of sun dried and roasted Termites are as shown in Table 1.

Table I: Proximate compositions of termite and the test diets.

Nutrients	Termite	Diets.
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	Sun dried	Roasted	Commercial	Experimental (Diet)
Moisture content	5.91	4.98	11.50	13.78
Crude fibre	11.00	7.64	6.68	7.91
Crude Protein	42.33	47.34	21.90	26.06
Crude lipids	41.00	40.90	6.40	7.21
Ash	5.02	4.10	15.47	15.98
NFE	0.01	0.02	49.90	42.84
Calcium	0.58	0.49	2.09	4.24
Phosphorus	0.36	0.31	0.07	0.56

The high value of crude protein (C.P) recorded in roasted Termites than the sun dried might suggest that the roasting process helps in releasing the unavailable proteins trapped in lipids and fibre. The value of crude protein in Termite meal obtained in this study (42.33% for sun dried and 47.34% for roasted Termite) differs from the 31.5% C.P reported by Aduku (1993), but slightly higher (47.34% C.P for roasted Termites), than 44% C.P for slightly fried with little quantity of salt added reported by Fadiyimu *et al.*, (2003).

There was a general increase in feed intake, net weight gain, and feed efficiency as the quail grow older in all groups (Table 2).

Parameters	Diets	
	Commercial	Experiential
Average feed intake (gms) (3 weeks)	124.3	124.4
Initial body weight (gms)	7.5	7.6
Weight gain (gms)	132.5	133.9
Feed conversion efficiency	0.93	0.92

The results also indicated that there was no significant difference ($P < 0.05$) in the average weight gain and feed efficiency in the commercial feed fed group when compared with the experimental feed fed group. Also, the average weekly feed consumption was relatively the same. These results showed that experimental feed using Termites as the source of animal proteins compete favourably with the commercial feed and is acceptable to the quail chicks. Crude protein level of the experimental diet was 26.06% and that of commercial (control)

feed was 21.90%. Previous reports by Haruna *et al* (1992) showed that quail performed better at protein levels of between 22% to 25%. The results of this study may suggest that Termite's protein (roasted) can be used as the sole source of animal protein in compounding poultry feed and therefore comparable to other sources.

It is therefore concluded that more research work need to be undertaken to ascertain the amino acid profile of Termites and other attributes that may be beneficial to animal production.

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