

Performance and Carcass Characteristics of Finisher Broilers Fed Shrimps Waste Meal

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Abstract: Shrimps which constitute >70% of sea catch on processing leaves the head, limbs, tail, etc., outside the meat portion that are processed for human consumption as a bulk of waste. The study was conducted to evaluate the effect of Shrimps Waste Meal (SWM) on the performance and carcass characteristics of broilers. About 96 anak broilers were randomly selected and assigned to four experimental treatments: T1-T4 at 4 weeks in a Completely Randomized Design (CRD). Each treatment had 2 replicates of 12 birds per replicate. The experimental diets were 0% SWM/100% broiler finisher, 5% SWM/95% broiler finisher, 10/90% broiler finisher and 15%SWM/85% broiler finisher. Data collected on live weight/live weight gain, feed consumption, feed gain ratio and carcass characteristics showed no significant difference ($p>0.05$) among treatment and there was no negative effect on the birds. Further studies should be carried out to test its effects on the meat and eating quality of broilers.

Key words: Shrimps, waste meal, performance, carcass characteristics, finisher broilers, Nigeria

INTRODUCTION

In this study, Balogun and Akegbejo-Samsons (1992) reported that about 1.6×10^4 MT of shrimp waste is generated annually in Nigeria and about 2.8×10^5 MT is generated from companies worldwide (Fox *et al.*, 1994). According to Nwanna *et al.* (2003), continuous production of shrimp waste without corresponding development of technology of utilizing the waste has resulted in waste collection, disposal and pollution problems. Channeling this waste into broiler feed production apart from minimizing cost of poultry production will according to Isaac *et al.* (2002), also bring about cleaner, safer and indeed healthier environment as materials that would have constituted environmental pollutants are turned into useful materials. Shrimp Waste Meal (SWM) is the dried and milled waste of the shrimp industry which consists of the head, shells and appendages of Shrimps (Ingweye *et al.*, 2008). It has the potential of being an alternative protein source in broiler ration partially or totally replacing the conventional protein source (Rosenfield *et al.*, 1997). Ingweye *et al.* (2008) reported that 25% SWM replacement of fish meal was optimum for broilers.

Gernat (2001) also reported that SWM could replace Soybean meal in layer diet at relatively high levels without causing detrimental effect on layer performance. Okoye *et al.* (2005) concluded that SWM is a valuable animal protein source for broilers and can be included up to 10% in both starter and finisher broiler diets.

This study was therefore carried out to evaluate the effect of shrimp waste meal on the performance and carcass characteristics of finisher broilers.

MATERIALS AND METHODS

Study site, materials and management: The study was carried out at the Poultry Unit of the Teaching and Research Farm of the University of Uyo, Uyo, Nigeria. The experimental feedstuff used was the sun-dried shrimp waste collected from the sea-port which was milled into meal. About 96 days old anak broiler chicks of mixed sexes were used in the experiment. They were brooded in a deep-litter system from day old to 4 weeks of age. Proprietary feed (Broiler starter) and adequate clean potable water were provided *ad libitum*. At the end of the 4th week, the birds were randomly allocated to four treatments, each replicated twice with each replicate having 12 birds. The treatments were: T1: 0% SWM/100% BF (Broiler Finisher: proprietary feed); T2: 5%SWM/ 95% BF; T3: 10%SWM/ 90% BF; T4: 15% SWM/ 85% BF.

Experimental diet and feeding: Shrimps Waste Meal (SWM) was fed to the birds as a protein supplement with the proprietary feed-Broiler Finisher (BF). The shrimp waste was milled into fine texture so that it could mix easily with the propriety feed.

The experimental feed was collected and processed each time it was needed to keep it fresh. About 2 kg of the diet was serves to the birds once in daily in each

replicate. This amount of feed was increased to 2.5 kg daily as the birds increased in age. Water was given to all the birds *ad libitum*.

Proximate composition: Proximate composition of the feed sample was determined using the method of Association of Analytical Chemist (AOAC, 1995).

Data collection: The initial weights of the birds were taken before the provision of the experimental feed. Data on live weight/live weight gain, feed consumption, feed gain ratio and carcass characteristics were collected.

Statistical analysis: All data collected were subjected to analysis of variance (Steel and Torrie, 1980) based on the Completely Randomized Design (CRD).

RESULTS AND DISCUSSION

Proximate composition: The proximate composition of the feed sample is shown in Table 1. The protein content in both samples were within the required level (19-21%) for broilers and the crude fat, crude fibre and ash were close to the values (6.20, 11.38, 20.41, respectively) reported by Gernat (2001).

Performance of the broilers: The result in Table 2 shows that feed intake (g) to be 1614.57 (T1), 1549.00 (T2) 1525.71 (T3) and 1541.29 (T4). There was no significant ($p>0.05$)

Table 1: Proximate analysis of feed samples

Components	Broiler Finisher (BF)	Shrimp Waste Meal (SWM)
Moisture	8.67	14.74
Dry matter	91.33	85.26
Crude protein	19.80	20.00
Crude fat	6.22	7.44
Crude fibre	3.33	8.46
Ash	5.00	24.50
NFE	34.35	60.40

Table 2: The performance characteristics of finisher broilers on SWM

Parameters	T1	T2	T3	T4
Initial body weight (g)	939.33	928.33	966.67	905.83
Final body weight (g)	2100.00	2241.67	2066.67	2120.83
Weight gain (g)	290.42	328.34	274.96	303.75
Feed consumption (g)	1614.57	1549.00	1525.71	1541.29
Feed conversion ratio	9.72	6.05	8.02	6.53

Table 3: Effect of SWM on carcass characteristics of broilers in grammes

Parameters	T1	T2	T3	T4
Live weight	2400.00	2575.00	2250.00	2300.00
Plucked weight	2175.00	2275.00	2075.00	2125.00
Dressed weight	1625.00	1775.00	1650.00	1700.00
Eviscerated weight	1850.00	1975.00	1775.00	1850.00
Neck	100.00	100.00	75.00	75.00
Wing	125.00	100.00	75.00	75.00
Thigh/drumstick	250.00	250.00	225.00	275.00
Breast	425.00	500.00	450.00	475.00
Liver	63.56	67.06	64.16	50.94
Gizzard	45.49	45.38	47.01	46.72
Heart	10.45	10.52	9.58	8.56

difference among treatment means inspite of the variation in values. However, feed intake was relatively higher in this research compared to those done with other rations. This according to Agunbiade *et al.* (2004), may be attributed to the sweet aroma impacted on the ration by SWM. Weight gain (g) was 290.42 (T1), 328.34 (T2), 274.96 (T3) and 303.75 (T4). There was no significant ($p>0.05$) difference in performance among the treatment means even though the values showed a normal variation. This result agrees with the result of Okoye *et al.* (2005) who had no significant difference in weight gain and feed to gain ratio of broiler fed SWM at finisher phase. Feed conversion ratio (g) 9.72 (T1), 6.05 (T2), 8.02 (T3), 6.55 (T4) did not differ ($p>0.05$) significantly from each other. The performance of the birds in this study agrees with Damron *et al.* (1964) who incorporated SWM at 9.1% level in broiler ration, Raab at 6.8% and Illian *et al.* (1985) at 10% and found no significant difference in performance.

Carcass evaluation of the broiler: There was no significance ($p>0.05$) difference in treatment means for live weight, plucked weight dressed weight, eviscerated weight, neck, wing, thigh/drumstick, breast, gizzard, liver and heart as shown in Table 3. The result agrees with Agunbiade *et al.* (2004) who had no significant difference ($p>0.05$) when SWM was supplemented in broiler diets $>50\%$.

CONCLUSION

Inspire of the non-significant ($p>0.05$) difference among the treatment means SWM supported the performance and carcass characteristics of the birds as no adverse condition was noticed; morphologically the birds were massive and appreciable. The meat and eating qualities of broilers fed with this feedstuff need be evaluated.

This therefore gives the impression that the last may not have been heard with respect to the potential of this material as a feedstuff for broilers and indeed other livestock species.

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