COMPARISON OF COMPOUNDED AND COMMERCIAL FEEDS IN KUROILER PRODUCTION

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Abstract

It has been established that feed accounts for about 75% of the total cost of poultry production yet, the quality of some commercial feeds has been compromised hence, the quest for utilization of locally formulated feed. In this study, feed ingredients were sourced locally and compounded into feed that yielded 24% crude protein representing Control diet (T1). Also, four commercial feeds (Hybrid®; Chikun®; Ultima® and Vital®) were bought from reputable sales outlets representing T2, T3, T4 and T5, respectively. The differences between feed offered and remnant was recorded weekly as feed intake and the cost of feed intake was determined using a standard procedure. Results showed that feed intake varied from 34 – 45g/bird (week 1), 45 – 49g/bird (week 2) and 51 – 59g/bird (week 3). At week 1, the cost of feed consumed was lowest (₦91) among the chicks fed Chikun feed while, those fed Vital feed had the highest cost (₦120). Subsequently, the cost of feed consumed was consistently lowest (₦116; ₦134) among the chicks fed the formulated feed whereas, ₦132 recorded in Hybrid® feed and ₦162 in Ultima feed were the highest cost of feed in weeks 2 and 3, respectively. Since the formulated feed compared favourably well with the commercial feed, farmers may produce feed locally to cut down cost of production.

Keywords: Formulated feed, commercial feed, chick mash, feed cost and quality.

Introduction

Kuroiler is a breed of chicken reared for meat and eggs hence it is often referred to as dual-purpose bird. It is a cross breed of Rhodes Island Red and White Leghorn. It has varieties of plumage patterns and colours like black, white, buff, red, silver-grey and blue. It is so similar to Noiler that they cannot be distinguished easily. Kuroiler is an active and hardy scavenger with an excellent growth rate weighing between 2.5 and 3.5kg with a capacity to lay 150 eggs per annum. It is not usually brood-oriented hence, would be satisfied with laying a single clutch of eggs per annum and the eggs varied from small to medium in size with a light brown shell (Akinbobola, 2022). It is a disease-resistant bird, very friendly, calm around people, larger and grows faster than local chickens. These benefits over local chickens make it a better choice for small-scale/backyard production. According to Akinbobola (2022), Kuroiler was originally bred in Andhra Pradesh in south India, but has been introduced into Uganda, Kenya and Nigeria, where it is raised for eggs and meat with satisfactory performance record, thereby improving African local chicken productivity.

According to Edache *et al*. (2018), erratic changes in price of feed ingredients, has constantly forced feed manufacturers to manipulate feed formulation, in order to maintain reasonable gross margin. In some other cases, the farmers do not have the expertise to formulate and produce quality poultry feeds in the farms thus, must rely on commercial feeds. This has resulted in high cost of poultry production thereby, further limiting poultry products availability in Nigeria. There are speculations that high cost of feed ingredients, will undoubtedly force manufacturers, to cut corners in compounding poultry feeds (Olajide *et al*. 2020). Recently, maize became very scarce and expensive in Nigeria and being the sole energy source in poultry feeds, it would definitely cause commercial feeds to be very expensive. Many commercial poultry feeds manufacturers, capitalized on this opportunity and hiked the price of poultry feeds beyond farmers reach, leading to closure of poultry productivity in many parts of the country. Consequently, with the introduction of Kuroiler into Nigeria, it might be more profitable to utilize locally available feed ingredients in formulating their feed, rather than use commercial feed. Hence, this study compared locally compounded and commercial feeds in Kuroiler production.

Materials and Methods

The study was carried out at the Teaching and Research Farm, Faculty of Agriculture, Nasarawa State University, Keffi, Shabu-Lafia Campus, located in the guinea savanna zone of north central Nigeria, between latitude 08º35'N and longitude 08º33'E with an altitude of 290m above sea level. The temperature ranges from 20.16 – 35.06ºC, relative humidity (74%), annual rainfall (1,168.90mm) with a total land area of 27,117km^2 and total population of 330,712 (NIMET, 2008; NPC, 2006). A total of 50 one-day-old Kuroiler chicks were weighed, allotted in a completely randomized design based on weight, to five treatments replicated twice such that each treatment had five chicks per replicate. Some of the feed ingredients (rice offal, groundnut cake, salt and whole maize) were sourced locally from Lafia metropolis, while others (fish meal, soybean, methionine and lysine) were bought from a reputable dealer in Abuja. These feed ingredients were used in formulating feed that represented the Control diet (T1) as presented in table 1. The commercial feeds (Hybrid®, Chikun®, Ultima® and Vital® designated as T2, T3, T4 and T5, respectively) were bought from a reputable livestock feed dealer in Lafia town. Samples of all the experimental diets were processed for proximate compositions determination, following standard procedures of AOAC (2010).

Table 1: Nutritional quality of the experimental diets

	Treatments				
Gross composition	**T1**	**T2**	**T3**	**T4**	**T5**
Whole maize (kg)	35	NK	NK	NK	NK
Rice offal (kg)	25	NK	NK	NK	NK
Groundnut cake (kg)	14	NK	NK	NK	NK
Fish meal (kg)	8	NK	NK	NK	NK
Soybean meal (kg)	16	NK	NK	NK	NK
Methionine (g)	0.5	NK	NK	NK	NK
Lysine (g)	0.5	NK	NK	NK	NK
Salt (g)	0.3	NK	NK	NK	NK
Premix (g)	0.5	NK	NK	NK	NK
Bone meal (g)	0.5	NK	NK	NK	NK
Total	100	NK	NK	NK	NK
Determined nutritional compositions					
Crude protein	24.02*	21.86	21.92	21.69	21.88
Crude fibre	7.59	6.23	6.56	6.18	6.25
Ether extract	4.62	4.69	4.63	4.85	4.91
Ash	7.70	5.98	6.97	6.70	5.98
Carbohydrate	51.44	47.96	48.28	46.75	52.22
Metabolizable energy kcal/kg ME	3,010.22	3,005.42	3,008.96	3,009.50	3,010.04

*: Crude protein contributions (T1 ingredients): Maize (2.8%), Rice offal (2.5%), Groundnut cake (6.58%), Fish meal (5.78%) and Soybean meal (6.4%) summing up to 24% in the compounded feed; NK: Not known.

Data collection and analysis

The experimental diets and clean drinking water were offered to the chicks *ad libitum* following a week acclimatisation period. The differences between the feed offered and the remnant represented the feed intake that was monitored weekly for a period of 3 weeks. The cost implication of feed intake was estimated using equation 1. The data collected were subjected to statistical analysis using SPSS (2011).

$$Cost\ of\ feed\ intake = \frac{Cost\ of\ a\ bag\ of\ feed\ (25kg)}{Weight\ of\ the\ feed\ (25kg)}\ X\ feed\ intake\ \ldots\ldots\ldots equation\ I$$

Results and Discussion

Gross compositions of the control diets and nutritional quality of the experimental diets are presented in table 1. The ingredients utilized supposedly provided up to 24% crude protein and energy ranging from 3,005.42 – 3,010.22 kcal/kg ME. These were seemingly within a range of 20 – 30% crude

protein and 2,800 – 3,000 kcal/kg ME energy, respectively determined in some commercial poultry feeds sold in Lafia (Idahor *et al*., 2010). The protein value was close to a range of 18 – 24% determined in broiler starter diet (Olajide *et al*., 2020) and 22 – 26% recommended for day-old chicks (Olomu, 2011). The energy value was close to a range of 2,500 – 3,500 kcal/kg ME recommended by Olomu (2011) for day-old and growing chicks, Therefore, the experimental diet was probably suitable for the day-old Kuroiler chicks.

Feed intake of the chicks fed compounded and commercial feeds in weeks 1 – 3 is presented in table 2. There were no statistical differences (P>0.05) among the birds across the treatments throughout the study period. It was observed that the feed intake was increasing with age of the birds, corroborating the report of Olomu (2011), that birds consume more feeds as they grow. Meanwhile, the feed intake in week 1 ranged from 34g in Chikun to 45g/bird in Vital, week 2 (45 – 49g/bird) and in week 3, the feed intake was lowest (51g/bird) in Hybrid and highest (59g/bird) in Ultima. These values were lower than a range of 81 – 95g consumed by broilers fed diets containing Sabara leaf meal (Balarabe *et al*., 2021) but close to 65 – 66g reported in broilers fed microbial phytase (Aguihe *et al*., 2013). The observed disparities could be largely due to breed differences and partly due to the environmental conditions of the study sites.

Table 2: Weekly feed intake of Kuroiler chicks fed compounded and commercial feeds

	Weekly feed intake/bird (g±STD)		
Treatments	**Week 1**	**Week 2**	**Week 3**
Control	38±0.18	49±0.17	57±0.05
Hybrid	42±0.15	49±0.16	51±0.17
Chikun	34±0.26	45±0.14	54±0.11
Ultima	40±0.11	45±0.19	59±0.04
Vital	45±0.19	46±0.18	58±0.05
Grand mean	40±0.15	47±0.03	56±0.02

Table 3 shows the cost implication of feeding Kuroiler chicks compounded and commercial feeds at weeks 1 to 3. There were statistical differences (P<0.05) across the treatments throughout the study period and it was shown that the cost of feeding was increasing by week. In week 1, cost of feed/bird was lowest in Chikun (₦91.13) followed by Control diet (₦94.65), Ultima (₦110.39), Hybrid (₦112.56) and Vital (₦120.60). This could be purely coincidental, because the feed consumed by the chicks were not uniform probably due to the varied energy contents and other nutritional qualities of the diets.

Table 3: Cost implication of feeding Kuroiler chicks with compounded and commercial feeds

Treatments	**Weekly cost of feed consumed/bird (₦±STD)**		
	Week 1	**Week 2**	**Week 3**
Control	94.65±34.13^{c}	116.65±41.94^{c}	134.99±31.36^{c}
Hybrid	112.56±41.47^{b}	132.97±42.69^{a}	136.91±46.69^{c}
Chikun	91.13±37.10^{c}	121.64±68.93^{b}	145.87±29.43^{b}
Ultima	110.39±29.13^{b}	124.79±51.58^{b}	162.86±10.43^{a}
Vital	120.60±48.05^{a}	123.28±71.14^{b}	155.82±13.17^{a}
Grand mean	105.87±15.04	123.86±11.35	147.85±28.41

$^{a, b, c}$: Means with the same superscript within the same column are not significantly different (p<0.05); ^{STD}: Standard deviation; Feed cost per 25 kg bag as at October, 2021: Control diet (₦ 5,900); Hybrid feed: (₦ 6,700); Chikun feed: (₦6,700); Ultima feed: (₦6,900); Vital feed: (₦6,700).

In week 2, the cost of feed/bird was highest (₦132.97) among the chicks fed Hybrid feed, the values recorded in Ultima (₦124.79), Vital (₦123.28) and Chikun (₦121.64) were statistically similar (P>0.05) whereas, a chick in the control diet consumed feed worth ₦116.65. This implied that

formulated feed may compare favourably well with exorbitant commercial feeds. In week 3, the cost of feed/bird (₦134.99) was lower in control compared to as high as ₦162.86 and ₦155.82 recorded in chicks fed Ultima and Vital feeds while, the chicks fed Hybrid feed (₦136.91) and Chikun feed (₦145.87) were not statistically different (P>0.05). The most expensive commercial feed was Ultima (₦6,900/25kg) whereas, the price of Hybrid, Chikun and Vital feeds was uniform at ₦6,700 but, the compounded feed (Control diet) was the cheapest (₦5,900) probably, because it excluded transportation, production and miscellaneous costs. This observation corroborates the reports of Adebayo *et al*. (2002) who reported that on farm feeds are cheaper than commercial feeds.

Although, the observations in Hybrid, Chikun and Vital feeds did not follow a particular trend, the cheapest (Control) and the most expensive (Ultima) feed, apparently suggested that cost of feed influenced the total cost of Kuroiler production. This observation is consistent with the report of Umeh and Odo (2002) that feed cost and feed quality are among the factors, which dictate farmer's preference for either commercial or self-compounded poultry feeds. In any case, the cost of feed consumed in the present study, is somewhat similar to a range of ₦70 to ₦107 reported elsewhere (Balarabe *et al*., 2021; Olajide *et al*., 2020). Therefore, feed could be formulated by the farmers, in order to reduce cost of poultry production.

Conclusion and Recommendation

The crude protein of the compounded feed was within the values recommended for chicks. The feed intake values were close to the values reported as normal in healthy chicks, suggesting that the compounded feed possibly, compared favourably well with the exorbitant commercial feeds. The formulated feed was the cheapest thus farmers could produce feed locally, in order to reduce cost of poultry production.

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