Slaughter yield, organ weight, abdominal fat, and consumer preference of noiler chicken on a diet with cashew kernel waste meal

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Abstract

The cashew nut industry produces cashew kernel waste meal (CKWM), a nutrient-rich by-product high in protein. CKWM has shown promise as a feed component for laying hens and broiler chickens. This study aimed at determining the slaughter yield, organ weight, abdominal fat, and consumer preference of noiler chicken on diets with cashew kernel waste meals. 270-day-old noiler chicks were randomly separated into five groups, with six replicates of 9 birds each. The treatment groups (W2, W3, W4, and W5) were fed diets with 5.0%, 10.0%, 15.0%, and 20.0% inclusion of cashew kernel waste meal, while the control group (W1) received a diet devoid of CKWM. The boilers were slaughtered on the 56th (last) day of the study, and their slaughter yield, organ weight, abdominal fat, and organoleptic attributes were assessed. The outcome revealed that the CKWM in the diets of noiler birds significantly affected ($p < 0.05$) their slaughter yield, organ weight, abdominal fat, and overall acceptability. Except for live weight, eviscerated weight, neck, and shank, the results of the slaughter yield showed significant differences ($p < 0.05$). All organ weights differ significantly ($p < 0.05$) except the pancreas. All the organoleptic properties except the overall acceptability were not influenced ($p > 0.05$). Comparing the results obtained with the different inclusion levels, diets with 5.0% CKWM inclusion had higher bled weight, dressing weight, drumstick, breast, and back weight, while up to 20.0% was tolerable for gizzard and spleen weight, abdominal fat, and acceptance. Thus 5.00% CKWM is recommended for improved slaughter yield and while up to 20.0% is acceptable for abdominal fat and consumer acceptance.

Keywords: carcass, visceral weight, sensory properties, dual-purpose chicken, cashew waste.

Rendimento de abate, peso de órgãos, gordura abdominal e preferência do consumidor de frangos de corte em dieta com farelo de resíduos de amêndoa de caju

Resumo

A indústria da castanha de caju produz farinha de resíduos de amêndoa de caju (*CKWM*), um subproduto rico em nutrientes e rico em proteínas. O *CKWM* tem se mostrado promissor como componente de ração para galinhas poedeiras e frangos de corte. Este estudo teve como objetivo determinar o rendimento de abate, o peso dos órgãos, a gordura abdominal e a preferência do consumidor de frangos de corte em dietas com farinhas de resíduos de amêndoa de caju. Pintos de abate com 270 dias de idade foram separados aleatoriamente em cinco grupos, com seis réplicas de 9 aves cada. Os grupos de tratamento (S2, S3, S4 e S5) foram alimentados com dietas com 5,0%, 10,0%, 15,0% e 20,0% de inclusão de farelo de castanha de caju, enquanto o grupo controle (S1) recebeu dieta desprovida de *CKWM*. As caldeiras foram abatidas no 56º (último) dia de estudo e foram avaliados o rendimento de abate, peso dos órgãos, gordura abdominal e atributos organolépticos. O resultado revelou que o *CKWM* nas dietas das aves de abate afetou significativamente ($p < 0,05$) o rendimento de abate, o peso dos órgãos, a gordura abdominal e a aceitabilidade geral. Com exceção do peso vivo, peso eviscerado, pescoço e pernil, os resultados do rendimento de abate apresentaram diferenças significativas ($p < 0,05$). Todos os pesos dos órgãos diferem significativamente ($p < 0,05$), exceto o pâncreas. Todas as propriedades organolépticas, exceto a aceitabilidade global, não foram influenciadas (p > 0,05). Comparando os resultados obtidos com os diferentes níveis de inclusão, as dietas com 5,0% de inclusão de *CKWM* apresentaram maiores peso de sangramento, peso de molho, peso de coxa, peito e dorso, enquanto até 20,0% foi tolerável para peso de moela e baço, gordura abdominal e aceitação. Assim, 5,0% de *CKWM* é recomendado para melhorar o rendimento do abate e enquanto até 20,0% é aceitável para gordura abdominal e aceitação do consumidor.

Palavras-chave: carcaça, peso visceral, propriedades sensoriais, frango de dupla finalidade, resíduo de caju.

1. Introduction

Noiler is a dual-purpose chicken producing excellent meat and eggs for smallholders to combat food insecurity and improve financial dependency (Oyebanji et al., 2018). Noiler is a crossbreed between a broiler and a local chicken (Adeleke et al., 2010). Yakubu et al. (2019) reiterated the heterotic superiority of noilers over local chicken in their performance rate, body mass, and feed conversion. The noiler chicken is more disease-resistant than broilers, grows faster, and weighs more than local chicken (Ajayi et al., 2020; Chah et al., 2014; Ajayi, 2010; Akinleye et al., 2011; Adeleke et al., 2010). Local chickens have lower productivity, small body size and weight, produce fewer eggs, with low feed efficiency. Additionally, the flavor of noiler chicken is superior and comparable to that of local chicken (BnetHub, 2021).

According to Apata & Ojo (2000), the human need for quality animal protein has become an international issue that demands urgent attention. According to nutritional projections, a 50-70% increase in food yield will be needed to feed two billion people by the year 2050 (Ericksen et al., 2009; Ilea, 2019). Future predictions of animal product consumption show an increase with the expanding world population (Larsen, 2014; Henchion et al., 2017; King et al., 2017). This expansion highlights the need to raise each animal's production and the total number of animals (Davis; D'Odorico, 2015). This need could be satisfied by increasing the production of poultry types.

The cost of poultry production has risen drastically in recent years because of the rise in feed ingredients mainly soya bean and corn (Raghavan, 2009, Ojediran et al., 2022b). Because of the feed ingredients price hikes, it is necessary to explore alternatives to conventional feed resources because feed costs constitute roughly 65-78% of the gross cost-on of investment (Onunkwo et al., 2019; Ahaotu et al., 2018, Ojediran et al., 2021).

According to Ahaotu et al. (2013), it becomes crucial to investigate various feed substances that are not beneficial to humans. Agida et al. (2019a) have recommended sourcing of least-cost alternative feedstuff, which generally consists of waste (Ojediran et al., 2019a, b) is not consumed by humans, and is readily available and cheap (Olomu, 2011) due to the rise in demand for maize grains among people, industries, and livestock. This will significantly reduce food crisis and food insecurity (Agida et al., 2019b). To rely on alternative sources of ingredients, particularly while it is endorsed as a shift to ingredients, for which there is less competition between man and animals may help if alternative sources are sufficiently available (Onu et al., 2013; Akande et al., 2015).

Cashew (*Anacardium occidentale* L) nut is a prime industrial and export vegetation that ranks third in the international manufacturing of edible nuts traded worldwide. Due to the abundance of the product in the tropics and its high content of polyunsaturated fatty acids, cashew kernel waste meal offers the potential to lower feed costs (Akinhanmi, 2008; Ojediran et al., 2021; Akomolafe; Asowata-Ayodele, 2022; Sruthi; Naidu, 2023). Reports have shown that cashew kernels, mainly the rejects have been applied as animal feed (Ojewola et al., 2004; Akande et al., 2015; Carlos et al., 2015; Ojediran et al., 2021; 2022b; Aslam et al., 2024). According to Akande & Gbadamosi (2018), industrially between 30 and 35% of cashew kernels are commonly rejected as damaged or burned at some point in the production process because they do not meet export or local minimum grades. Pollution problems can be reduced by using cashew nuts as animal feed. As a result of roasting cashew nut kernels, cashew kernel waste meal has a high protein concentration (21.10-26.56%) and energy content (3984-4285 kcal/kg^{-1}) (Ojediran et al., 2021, 2022b). Most research on the use of CKWM does not probe the carcass characteristics and consumer preference.

Thus, there is limited research on the use of CKWM in poultry diets, especially noiler chickens. Therefore, this study provides valuable information on the use of CKWM in noiler chicken diets, and its influence on slaughter yield, organ weight, and consumer preference.

2. Materials and Methods

2.1 Experimental noilers

Two hundred and seventy (270) noiler 1d-old chicks were procured from Amo farm Sieberer Hatchery Limited in Oyo, and they were acclimatized for seven days before being introduced to the research diets. Their weights were determined at the commencement of the trial and distributed into 5 sets, with six replicates of 9 birds each. They were raised on deep litter in an open-sided house with the litter changed every week throughout the experimental period. They were supplied with fresh ration and water without restriction.

2.2 Test ingredients

The test ingredient was procured from a reputable cashew nut processing firm. The discarded kernel was hammer milled with a 2mm sieve to achieve the cashew kernel waste meal.

2.3 Formulation of experimental diets

Cashew kernel waste meal was included at 0% for the control diet (Diet W1), while it was incorporated at 5.0%, 10.0%, 15.0%, and 20.0% in diets W2, W3, W4, and W5 (Table 1).

Table 1. Composition of the diet (starter phase).

Ingredients (%) /Diets	W1	W2	W3	W4	W5
Maize	52.50	47.50	42.50	36.00	24.00
Fish meal	4.00	3.50	3.00	2.00	3.50
Soya bean meal	32.00	32.00	32.00	32.00	25.00
Full fat cashew	0.00	5.00	10.00	15.00	20.00
Palm Kernel Cake	0.00	0.50	0.50	1.50	9.00
Wheat offal	5.50	5.50	6.00	7.50	12.50
*Fixed ingredients	6.00	6.00	6.00	6.00	6.00
Total (kg)	100.00	100.00	100.00	100.00	100
Nutrient composition					
ME (kcal/kg)	2903.85	2977.24	3048.13	3104.00	3103.00
Crude Protein	22.62	23.00	23.39	23.64	23.94
Ether Extract	3.65	3.44	7.23	8.99	11.08
Crude Fibre	3.18	3.16	3.14	3.30	4.09
Calcium	1.63	1.68	1.73	1.76	1.85
Phosphorus	0.60	0.82	1.05	1.27	1.50
Lysine	1.47	1.63	1.79	1.91	2.04
Methionine	0.62	0.68	0.73	0.78	0.85

Note: *Fixed ingredients = Bone meal: 3.0%, Limestone: 2.0%, Lysine: 0.25%, Methionine: 0.25%, Premix: 0.25%, Salt: 0.25%. ME = Metabolizable Energy. Source: Authors, 2024.

Table 2. Composition of the diets (Grower phase).

Ingredients (%) / Diets	W1	W2	W3	W4	W5
Maize	56.00	53.00	48.00	39.00	31.00
Fish meal	1.00	1.00	1.00	1.00	1.00
Soya bean meal	24.00	23.00	21.00	19.00	17.00
Full fat cashew	0.00	5.00	10.00	15.00	20.00
Palm Kernel Cake	7.00	6.00	6.00	7.00	10.00
Wheat offal	6.00	6.00	8.00	13.00	15.00
*Fixed ingredients	6.00	6.00	6.00	6.00	6.00
Total (kg)	100.00	100.00	100.00	100.00	100
Nutrient composition					
ME (kcal/kg)	2921.04	3010.11	3074.34	3094.52	3136.89
Crude Protein	18.67	18.87	18.99	19.45	19.86
Ether Extract	3.69	5.49	7.31	9.13	11.02
Crude Fibre	3.68	3.50	3.51	3.82	4.14
Calcium		1.57	1.62	1.68	1.73
Phosphorus	0.54	0.77	1.00	1.24	1.48
Lysine	1.10	1.25	1.39	1.53	1.67
Methionine	0.55	0.61	0.66	0.72	0.78

Note: *Fixed ingredients = Bone meal: 3.0%, Limestone: 2.0%, Lysine: 0.25%, Methionine: 0.25%, Premix: 0.25, Salt: 0.25. ME = Metabolizable Energy. Source: Authors, 2024.

2.4 Data collection

The following data were collected

2.4.1 Slaughter yield and organ weight

Two noilers from each replicate were starved for six hours before termination of the experiment were stunned, slaughtered by severing the jugular vein on the 56th (last) day of the study, and fully bled. Bled weight, dressed weight, eviscerated weight, carcass weight, head, shanks, drumsticks, thighs, neck, wings, breast and back, visceral organs, and abdominal fat, were scaled naiting a sensitive weighing balance and articulable as a percent of live weight.

2.4.2 Organoleptic Properties

Samples from the breast of the slaughtered birds from each replicate were assessed. The meat samples were prepared by cutting the samples to equal sizes, kept in pre-labeled nylons, cooked in boiling water at 950C for 15 minutes, allowed to cool and served to a 10-person untrained panel as coded samples. It was scored using a modified hedonic measure. The meat was graded on its color, flavor, texture, tenderness, juiciness, and overall acceptability on a nine-point hedonic scale (1 = dislike extremely, 9 = like extremely) (Price; Schweigert, 1971, Válková, 2012).

2.5 Statistics

Using the SPSS v25 program, all data recorded were subdued to one-way ANOVA in a CRD while the means were separated using *Duncan's* Multiple Range Test option.

3. Results

3.1 Slaughter yield of noiler-fed cashew kernel waste meal (1-56 days).

Table 3 shows the slaughter yield of noiler chicken offer cashew kernel waste meal CKWM. LW, EW, neck, and shank were not statistically different ($p > 0.05$). However, BW, DW, head, drumstick, thigh, wing breast, and back were significant ($p < 0.05$). The BW showed that birds fed diet W2 had the highest value, those fed diets W1 and W3 had significantly lower ($p < 0.05$) bleed weight while W4 and W5 compared favorably. Noilers fed diet W2 had a higher value, birds given diet W1 recorded the least ($p < 0.05$) while the ones given diets W3, W4, and W5 compared favorably ($p > 0.05$). Values for head indicated that noilers nourished with diets W4 and W3 significantly differed ($p < 0.05$) while others were comparable. The result obtained for the drumstick ranged from 9.81 (W1) to 11.97 (W2) ($p > 0.05$).

The values obtained for the thigh were 9.81%, 8.41%, 9.74%, 9.22%, and 8.75% for birds fed diet W1-W5 respectively. The wing weight showed that birds fed diets W4 had the lowest value while others were higher ($p <$ 0.05). Noiler birds given W3 recorded the smallest breast weight while noilers fed W1, W2, and W5 had higher values. The back weight of birds fed diets W2-W5 was higher than those fed the diet W1.

Table 3. Slaughter yield of noiler chicken offered cashew kernel waste meal.

Parameters	W1	W2	W3	W4	W5	SEM	P-value
LW	1584.55	1538.55	1528.65	1544.05	1520.60	40.99	0.99
BW	94.29^{b}	95.94^{a}	95.16^{b}	94.71^{ab}	95.77^{ab}	0.24	0.01
DW	87.98^{b}	90.13^{a}	89.21^{ab}	89.80^{ab}	89.52^{ab}	0.30	0.01
EW	71.67	74.13	72.20	70.51	75.14	0.76	0.33
CW	63.11^{ab}	65.78^{a}	63.44^{ab}	62.09^{b}	63.37^{ab}	0.32	0.04
Head	2.87^{b}	3.22^{ab}	3.20^{ab}	3.58^{a}	3.35^{ab}	0.09	0.01
Neck	4.75	4.54	4.52	4.40	4.02	0.13	0.50
Shank	5.29	4.97	5.15	4.46	4.86	0.14	0.49
Drumstick	10.15^{bc}	11.97^{a}	11.08^{ab}	9.81^{c}	10.26^{ab}	0.24	0.01
Thigh	9.81^{a}	8.41^{c}	9.74^{ab}	9.22^{abc}	8.75^{bc}	0.19	0.04
Wing	9.54^{a}	9.65^{a}	9.81^{a}	5.16^{b}	9.82^{a}	0.64	0.05
Breast	16.31^{a}	15.96^{a}	14.07^{b}	14.61^{ab}	15.97^{a}	0.30	0.04
Back	12.54^{b}	15.31^{a}	14.34^{a}	14.68^{a}	14.54^{a}	0.28	0.00

Note: $^{a, b, c}$ Means with different superscripts on the same row are significantly different ($p < 0.05$). SEM = Standard error of mean, LW = live weight, BW = bled weight, DW = dressed weight, EW = eviscerated weight. Source: Authors, 2024.

3.2 Organ Weight of noiler-fed cashew kernel waste meal

Table 4 reveals the organ weights and the abdominal fat of noiler birds fed cashew kernel waste meal. Significant disparities ($p < 0.05$) were noticed in the weight of the liver, kidney, lungs, heart, gizzard, spleen, proventriculus, GIT, and abdominal fat, while the pancreas was not significantly different.

The liver weight of birds fed diets W1-W3 were lower, and those fed W4 and W5 were elevated ($p < 0.05$). The kidney weight was higher in noilers offered diet W3 and lowest for those fed diet W2. Similarly, noilers given diet W3 recorded higher values ($p < 0.05$). Observation of lungs showed that diet W3 had a higher value different from those fed diet W1 and W2 but comparable to those fed diet W4 and W5 compared with all other diets. The heart weight revealed that birds given W3 had higher values while those offered W1 recorded the lowest.

The least whole gizzard weight was observed in diets W1 and W3 ($p> 0.05$) while noilers offered remaining diets had significantly higher ($p < 0.05$) values. The empty gizzard weight showed that birds fed diets W4 and W5 had higher values, W3 had the lowest value while others nourished with diets W1 and W2 compared favorably ($p < 0.05$). The spleen weight was least for birds fed diets W1 and W2 ($p < 0.05$) while birds on diets W3-W5 were higher ($p < 0.05$). The proventriculus of the noilers birds were 0.46%, 0.46%, 0.57%, 0.75%, and 0.45% for birds fed diets W1-W5 respectively. The GIT weight was higher in birds fed diet W4, those offered diet W2 had the lowest while those fed diets W1, W3 and W5 compared favourably. The abdominal fat was highest in birds fed diet W1, those on diets W2-W4 were lower while those fed diet W5 was comparable.

Table 4. Organ weight and abdominal fat of noiler fed cashew kernel waste meal.

Parameters	W1	W2	W3	W4	W5	SEM	P-value
Liver	2.00^{b}	2.15^{b}	2.19^{b}	2.51^{a}	2.47^{a}	0.06	0.01
Kidney	0.45^{b}	0.25^{c}	0.62^{a}	0.58^{ab}	0.57^{ab}	0.04	0.00
Lungs	0.51^{bc}	0.45^{b}	0.64^{a}	0.59^{ab}	0.52^{abc}	0.02	0.05
Heart	0.43^{c}	0.49^{bc}	0.60^{a}	0.55^{ab}	0.46^{bc}	0.02	0.02
Whole gizzard	3.43^{b}	3.96^{a}	3.27^{b}	4.12^{a}	4.19^{a}	0.11	0.00
Empty gizzard	2.41^{ab}	2.35^{ab}	2.13^{b}	2.71^{a}	2.57^{a}	0.07	0.04
Pancrease	0.22	0.23	0.22	0.22	0.18	0.01	0.23
Spleen	0.13^{b}	0.14^{b}	0.22^{a}	0.15^{a}	0.22^{a}	0.01	0.00
Proventiculus	0.46^{bc}	0.46^{bc}	0.57^{b}	0.75^{a}	0.45^{c}	0.03	0.00
GIT	15.46^{ab}	14.28^{b}	16.66^{ab}	18.18^{a}	16.98^{ab}	0.47	0.05
Abdominal fat	2.42^{a}	1.07^{b}	1.18^{b}	1.19^{b}	1.44^{ab}	0.18	0.03

Note: ^{a,b,c} Means with different superscripts on the same row are significantly different ($p < 0.05$). SEM = Standard error of the mean, GIT = gastrointestinal tracts. Source: Authors, 2024.

3.3 Organoleptic properties of noiler-fed cashew kernel waste meal

The organoleptic properties of noiler fed cashew kernel waste meal are presented in (Table 5). The table illustrated that color, flavor, tenderness, juiciness, and texture were not statistically different ($p > 0.05$) while overall acceptability was influenced ($p < 0.05$). The overall acceptability shows that W1 had the highest numerical value (7.20), while W3 (5.60) had the least numerical value. However, W2 (7.00), W4 (6.00) and W5 (6.40) were in between.

Table 5. The organoleptic properties of noiler fed cashew kernel waste meal (1-56 days).

Parameters	W1	W2	W3	W4	W5	SEM	P-value
Colour	7.90	7.40	7.30	6.70	6.80	0.21	0.34
Flavour	3.20	3.70	3.30	4.00	4.10	0.23	0.67
Tenderness	5.90	5.90	5.70	6.50	5.50	0.22	0.68
Juiciness	4.70	5.60	5.40	5.80	5.20	0.24	0.66
Texture	5.50	5.50	6.60	6.00	5.30	0.20	0.52
OA	7.20^{a}	7.00^{ab}	5.60^{b}	6.00^{ab}	6.40^{ab}	0.23	0.04

Note: $^{a, b}$ Means with different superscripts on the same row are significantly different ($p < 0.05$). OA = Overall Acceptability; SEM = Standard Error of Mean. Source: Authors, 2024.

4. Discussion

The significant carcass properties contradict the account of Suleiman et al. (2023). This shows that housing may not affect carcass characteristics, but nutrition does. The observation of this study indicated that the noiler chicken fed 5% cashew kernel waste meal had the better-eviscerated weight, dressed weight, carcass weight, drum stick, breast, and back yield over other dietary treatments with the inclusion of CKWM. This could be attributed to efficient feed conversion. Effective feed conversion improves muscle development (Ojediran et al., 2018). The bleed weight is higher than that reported by Nera black cocks. The dressing percentage recorded in this study corroborates that of Oyewale et al. (2021) that the dressing percentage of noiler was higher than other dual-purpose chickens such as Kuroiler, FUNAAB Alpha, Shika brown, Fulani, and Sasso. The thigh weight was significantly higher in noilers offered the control diet. This contradicts the report of Abioye et al. (2017) and

Ojediran et al. (2018) who observed a significant increase in thigh weight of birds fed fermented African Yam Bean (*Sphenostylis stenocarpa*) - Pigeon Pea (*Cajanus cajan*) and 40% dietary lysine respectively. The carcass weight deviates from the results by Oluwasola (2006), who discovered a notable increase in drumstick, thigh, wings, head, and abdominal fat of hens-fed diets with up to 50% soy protein substitution by including 28.3% CKWM. This study contradicts the findings of Freitas et al. (2006) on carcass traits. Observed breast weight shows there is tissue accretion with the use of CKWM as observed by Ojediran et al. (2018) with the use of lysine in broilers. The increased back weight in noilers offered CKWM may be linked to the nutritional content of the feed.

According to Ojediran et al. (2016), broiler organ weight is recognized to represent an anatomic reaction to feed offered. All parameters except the pancreas were significantly influenced by cashew kernel waste meal which contradicts the findings of Ojediran et al. (2017a) that most internal organs of broilers fed low crude protein supplemented with varying levels of lysine showed non-significant weight. The hypertrophy of liver weight in birds fed CKWM, especially at 15% and 20% may be attributed to the numerous functions of the liver such as bile production, deamination, and storage of vitamins and minerals in CKWM. Significant quadratic observations in the kidney, lungs, heart, and proventriculus were similar to the report of Ojediran et al. (2017b). Since the variance in the relative weights of the lungs did not follow a clear pattern, these differences might not be related to the test diets.

This corroborates the observation of Omoikhoje et al. (2011) who fed roasted fluted pumpkin pod husk waste to broiler chicken. Hypertrophy of the gizzard at 15 and 20% CKWM suggests overworking of the muscles (Fanimo et al. 2007a, b; Ojediran et al., 2022b). It can be linked to the CF and EE of the diet. The findings of Ani et al. (2013), who fed broilers *Gongronema latifolium* leaf meal, are supported by observations of the heart and gizzard. The increased weight of the gizzard in birds fed diets W4 and W5 suggests that the muscle was strained as the organ for mechanical digestion (Ojediran et al., 2022a).

Contrary to the findings of Ayoola et al. (2023), who found that including coconut cake meal in noiler diets did not result in the hypertrophy of their organs, cashew kernel waste meal significantly affected the weights of the kidney, heart, liver, lungs, and gizzard. Ojediran et al. (2016) related liver and kidney enlargement to the possibility of congestion in broilers fed Jatropha curcas kernel meal.

Abdominal fat was higher in birds on the control diet, and this contradicts the findings of Ojediran et al. (2022b) who attributed the high abdominal fat in broiler chicks fed diet substituting full-fat soybean meal with undefeated cashew reject kernel meal to high energy level. The randomness observed in the abdominal fat was in contrast to the result of Rezaei et al. (2004) and Ojediran et al. (2017a) who observed that decreasing dietary protein in broilers increased abdominal fat significantly.

Broilers were fed Ricinus communis by Akande et al. (2012), who attributed little organ alterations to the toxicity of residual anti-nutritional substances. In contrast to the findings of Ojewola & Longe (2000), who stated that the sizes and dimensions of broiler parts were closely associated with the carcass weights, the organ proportions showed no discernible trend.

As the inclusion level was increased, there was a linear decrease in the overall acceptability. The result of this study is contrary to previous studies that have shown that the use of cashew apple as a feed ingredient for poultry has no adverse effect on the quality of the meat (Okpanachi et al., 2015). Therefore, the negative effect of cashew kernel waste meal on the overall acceptability of the meat could be linked to several factors. The presence of high levels of carbohydrates in the cashew kernel waste meal could cause an increase in the fat deposition in the broiler chicken which could lead to a decrease in its tenderness and juiciness. Furthermore, the presence of antioxidants and other bioactive compounds in the cashew kernel waste meal could also affect the flavor and texture of the noiler birds which could lead to a decrease in its overall acceptability. Cashew kernel waste meal has a high level of tannins, which are known to bind with proteins and reduce their digestibility (Aletor et al., 2005).

The high fiber content of cashew kernel waste meal may also have contributed to the decreased overall acceptability of the meat. Fiber has been shown to increase the hardness and chewiness of meat, which can lead to a decrease in overall acceptability (DalleZotte; Szendrő, 2011).

5. Conclusions

It was noted that diets with 5.0% CKWM inclusion had higher bled weight, dressing weight, drumstick, breast, and back weight. However, higher levels up to 20.0% CKWM favours gizzard and spleen weight abdominal fat, and consumer acceptance. In conclusion, noiler chickens can tolerate up to 20.0% inclusion level. However, 5.0% CKWM is recommended for improved slaughter yield.

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7. Authors' Contributions

Taiwo Kayode Ojediran: conceptualization, designed the experiment, and analyzed the data. *Olajide Samuel Olofintuyi*: performed the experiment, interpreted the data, and wrote the first draft. *Blessing Ruth Fasola*: experimented, interpreted the data, and wrote the first draft. *Isiak Adewale Emiola*: contributed analysis tools and corrected the draft.

8. Conflicts of Interest

No conflicts of interest.

9. Ethics Approval

Yes, applicable. All procedures employed in this study were sanctioned by the Animal and Research Ethics Committee of the Ladoke Akintola University of Technology with approval number ANB/20/21-3/170087U.

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